Final Report of the Investigation Committee In the Matter of Dr. Mark J. Jackson

I. Executive Summary

Allegations of Research Misconduct against Professor Mark Jackson, formerly of the Department of Mechanical Engineering Technology, College of Technology, Purdue University, were presented to Purdue's Research Integrity Officer on April 23, 2010 and November 18, 2010. These allegations were reviewed by an Inquiry Committee constituted under Purdue Policy VIII.3.1. In a report dated June 29, 2011, the Inquiry Committee found unanimously that the majority of these allegations satisfied the Policy's Investigation Criteria and warranted further investigation. An Investigation Committee was constituted under Purdue Policy III.A.2 to investigate the allegations forwarded by the Inquiry Committee. Following its review of the allegations warranting investigations identified by the Inquiry Committee, the Investigation Committee reached a unanimous conclusion that the preponderance of the evidence supports findings of Plagiarism for allegations 1.1a-f, 1.2b, 1.3a-b, 1.4e, 1.5b, 1.5d, 1.5e, 1.6, 1.7b, 1.8d, 1.8f, 1.8g, 2.1, and 2.2; findings of Falsification for allegations 1.5e, 1.6, 1.7b, and 1.8e-f; and findings of Fabrication for allegations 1.5e, 1.6, 1.7b, and 1.8f. As a result, the Investigation Committee concludes unanimously that the Respondent has committee Research Misconduct.

II. Introduction and Procedural History

Allegations of Research Misconduct against Professor Mark Jackson, Department of Mechanical Engineering Technology, College of Technology, were presented to Purdue University's Research Integrity Officer, Professor Peter E. Dunn, in a letter dated 23 April 2010 from and of the School of Industrial Engineering and of the School of Materials Engineering, who will be referred to as Complainants.

Specifically, it was alleged that Prof. Jackson published research results of the above named Complainants and their collaborators. This included allegedly publishing original figures and research results without permission, and, in many instances, without appropriate attribution. Alleged appropriation of results, word-for-word copying, inappropriate paraphrasing, and/or style plagiarism of previously published work were also alleged to have occurred. In addition, it was alleged that fabrication/falsification was committed in the form of misrepresentation of data, including figures, text and results. At least eight (8) publications authored or co-authored by Prof. Jackson were identified in support of these allegations. Materials provided by the Complainants documenting this alleged research misconduct consisted of a detailed summary of the alleged misrepresentation of research results in eight (8) publications, and copies of the Complainant's publications and presentations which are alleged to have been the original source materials. Prof. Jackson was informed of this allegation in a letter dated 23 July 2010 and responded in a letter dated 31 July 2010.

Documentation supporting additional alleged plagiarism was presented to the Research Integrity Officer by in a meeting on 18 November 2010. Copies of the alleged source document, an article by Milton C. Shaw published in 2003, and book chapters authored Prof. Jackson and published in 2006 and 2007 containing identical or nearly identical text from Dr. Shaw's article without attribution were provided as documentation of this alleged plagiarism. Prof. Jackson was informed of this allegation in a letter dated 28 January 2011 and responded in an email message dated 27 March 2011.

A Purdue University Inquiry Committee, chaired by Professor , reviewed these allegations and supporting documentation, and the Respondent's responses to the allegation. The Committee concluded unanimously, in a report dated June 29, 2011, that Investigation Criteria identified in Purdue's Policy on Research Misconduct (Policy VIII.3.1) were satisfied for several of the allegations, and, thus, appointment of an Investigation Committee was warranted. Allegations of Research Misconduct forwarded for investigation by the Inquiry Committee are presented below (see Final Report of the Inquiry Committee).

The Respondent was informed of this determination and provided a copy of the Final Report of the Inquiry Committee on June 30, 2011. Shortly after being informed of the determination of the Inquiry Committee, the Respondent left Purdue University and did not return.

On September 23, 2011, the Research Integrity Officer sent a letter by certified mail to the Respondent's last known local address and, by email, to an address provided by the College of Technology, informing the Respondent of the proposed membership of an Investigation Committee. No reply was received from the Respondent to either of these attempted communications. The Research Integrity Officer was unable to locate the Respondent from September 2011 until August 2014, at which time the Research Integrity Officer became aware of the Respondent's appointment at Kansas State University – Salina, and learned of a home address. On August 5, 2014, the Research Integrity Officer communicated with the Respondent in writing via courier informing him that an Investigation Committee would be appointed.

The Purdue University Investigation Committee in the matter of Prof. Mark J. Jackson consisting of , Professor of Electrical and Computer Engineering, School of Electrical and Computer Engineering, College of Engineering, Purdue University, chairperson;

, School of Mechanical Engineering, College of Engineering, Purdue University; and , Associate Professor of Mechanical Engineering Technology, School of Engineering and Technology, Indiana University-Purdue University Indianapolis; was appointed by the Research Integrity Officer on December 4, 2014. The Committee's charge was to investigate the allegations of potential Research Misconduct forwarded by the Inquiry Committee and to determine, based on a preponderance of the evidence, whether the Respondent had committed Research Misconduct.

The Inquiry and Investigation processes were executed under procedures specified by Purdue University Policy III.A.1. The Investigation Committee met numerous times to examine the charge and supporting evidence, and to discuss the case in advance of hearings with the Complainants (May 8, 2015), witness (May 8, 2015), witness (June 3, 2015), and the Respondent (November 21, 2015). The Committee met on

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several additional occasions to discuss evidence gathered during the hearings and received in written form, and to vote on each of the allegations of potential Research Misconduct before them. The Committee's draft final report was approved on April 7, 2016.

The draft final report was delivered to the Respondent by hand on Thursday, April 14, 2016, with a cover letter reminding the Respondent of the 15 calendar days from date of his receipt during which he was permitted notify the RIO in writing of any errors and provide any comments. The deadline for written notification of errors or to provide comment was then Friday, April 29, 2016. On Friday, April 15, 2016, the Respondent requested electronic copies of all evidentiary documents in pdf format and photographic images of the physical evidence received by the RIO from Respondent in connection with this matter. On Monday, April 18, 2016, a shared Google Drive was created, and electronic copies of those evidentiary documents and digital pictures were loaded onto the shared Google Drive by Wednesday, April 20, 2016. The Respondent acknowledged access to the shared Google Drive on that date. On April 20, 2016, the Respondent requested that the contents of the Cavendish notebooks that he had provided the RIO in 2010 be scanned and provided. The Respondent was notified of the addition of the scanned Cavendish notebooks to the shared Drive on Friday, April 22, 2016. The Respondent requested a digital pdf copy of the draft final report on Sunday, April 24, 2016, and the Respondent was notified that this document had been added to the shared drive on Monday, April 25, 2016. On Thursday, April 28, 2016, the Respondent requested by email an extension of the deadline for submission of written corrections and comments until Friday, May 13, 2016, and that request was granted on the day it was received. As of midnight on Friday, May 13, 2016, no written corrections or comments regarding the draft final report were received from the Respondent. On Sunday, May 15, 2016, Respondent gave notice by email that he would "endeavour to complete the rebuttal to the draft final report this week." On Tuesday, May 17, 2016, the Respondent was notified that the period for submission of corrections and comments had expired on May 13 and the draft final report would be finalized. The Report of the Investigation Committee in the Matter of Dr. Mark J. Jackson was finalized by the Committee on May 23, 2016. The Committee's Final Report of Investigation will be delivered to the Respondent with a cover letter reminding the Respondent of Policy III.A.2's provisions for appeal of findings of Research Misconduct, and distributed to the Chief Academic Officer, Involved Dean, and Chairperson of the Faculty Affairs Committee of the University Senate as specified by Policy III.A.2. Also, as specified by Policy III.A.2, the Complainants will be notified of the findings of Research Misconduct.

The Research Integrity Officer, Professor Peter E. Dunn, provided staff and logistical support for the Investigation Committee's deliberations. Legal counsel was provided to the Investigation Committee by William P. Kealey, Stuart and Branigin LLP.

III. Regulatory Standards

The charges to the Inquiry and Investigation Committees and Committee procedures were governed by Purdue Policies VIII.3.1 and III.A.2. Purdue Policy VIII.3.1 was adopted on October 1, 2008, and renamed to Policy III.A.2 on November 18, 2011.

As defined in Purdue Policies VIII.3.1 and III.A.2, Research Misconduct is "conduct by Purdue Associate taking place at Purdue or in connection with Purdue research that constitutes Falsification, Fabrication, or Plagiarism in proposing, performing, or reviewing research, or in reporting research results." Falsification is defined as "manipulating research materials, equipment, or processes, or changing or omitting data or results so that the research involved is not accurately represented in the research record." Fabrication is defined as "making up data or results and recording or reporting them." Plagiarism is defined as "the appropriation of another person's ideas, processes, results, or words without giving appropriate credit."

Purdue Policies VIII.3.1 and III.A.2 specify the requirements to be satisfied for an Investigation Committee to make a finding of research misconduct. For a finding of research misconduct, "the Committee must conclude that the evidence before it establishes that it is more likely than not that:

- a) the Respondent intentionally, knowingly, or recklessly committed Research Misconduct as defined in this Policy;
- b) the Respondent's actions departed significantly from standard practices for major research institutions such as Purdue; and
- c) the alleged conduct does not arise out of honest errors or differences of opinion."

IV. Allegations Forwarded for Investigation by the Inquiry Committee

In its Final Report (see Appendix I), the Inquiry Committee stated:

For allegations 1.1a-g, 1.2a-b, 1.3a-c, 1.4a-h, 1.5a-f, 1.6, 1.7a-c, 1.8a-g, 2.1, and 2.2, we have determined that an investigation into the allegations of potential Research Misconduct is warranted because the Investigation Criteria have been satisfied. For each of those allegations, there is a reasonable basis for concluding that the allegation falls within the definition of "Research Misconduct" in Policy VIII.3.1. For each of those allegations, the allegation may have substance, based on the Inquiry Committee's review of the evidence and records that it considered.

<u>Note:</u> The verbatim finding of the Inquiry Committee regarding each forwarded allegation is shown in *italics* within quotation marks following the statement of the allegation below.

Thus, the following allegations were forwarded for investigation:

Allegation 1.1: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations of a paper by the complainants by using word-for-word, paraphrasing, and style plagiarism, and reproducing illustrations in a paper entitled "**Surface Coatings Deposited Using Recycled Chips and Turnings**," M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

Allegation 1.1a: The introduction section of this paper includes word-for-word, paraphrasing, and style plagiarism of the authors' work published by the authors in Brown et al. (2002) Journal of Materials Research [1].

Allegation 1.1b: Figure 1 shows an optical micrograph of a pure copper chip, which is an image from the authors' work published by the authors in Brown et al. (2002) [1]. No source for this previously published figure is given anywhere in the Jackson paper.

Allegation 1.1c: Figure 2 shows a collection of four Transmission Electron microscopy (TEM) images described as a "collage," of four different alloys produced by the authors. This grouping of these images has not been previously published by the authors, although three of the four individual images have been published by the authors in Swaminathan et al. (2007) Journal of Materials Research [2]. All four of these micrographs have been presented together by the authors multiple times in various conference presentations. [e.g. 3-6] The caption of Fig. 2 names the four different alloys but does not distinguish which alloy corresponds to which micrograph. No source for these images is given anywhere in the Jackson paper.

Allegation 1.1d: Fig. 3 is a bar chart originally given in an oral presentation co-authored bystudentsandandpresented at an SAE Aerospace Conference inOctober 2005 [4]. The figure subsequently appeared in the Master's Thesis of[7]and had not been published by the authors. No source for this figure is given anywhere in theJackson paper.

Allegation 1.1e: Fig. 4 shows a photograph of an early Modulation-Assisted Machining (MAM) device produced by the authors in the authors' lab. This picture was taken by the authors and was presented by the authors at the SAE Aerospace Conference in October 2005 (see slide 14 in Ref [4]; the image in this Jackson paper appears to be a simple digital compression in the horizontal direction of the original image). This picture has not been published by the authors due to intellectual property implications. This device has been patented and licensed to . No reference to this photograph is provided anywhere in the paper.

Allegation 1.1f: Fig 5 shows two images of machining chips produced by the authors in the author's lab, labeled in the captions as having been produced "with and without" modulation using the device shown in Fig. 4. The figure caption does not distinguish which of the two pictures shows chips produced with modulation and which shows chips produced without modulation. These images also have been presented by the authors in posters and oral presentations [3, 4], but have not been published. No reference for the source of these images is provided anywhere in the paper.

"If found to be true, Allegations 1.1a-f would represent plagiarism and falsification as defined in Policy VIII.3.1."

Allegation 1.1g: The acknowledgements section of this paper thanks S. Chandrasekar and J. Mann "for use of equipments and facilities" The authors are not aware that Jackson used any facilities or equipment(s) in their lab.

"If found to be true, Allegation 1.1g would represent fabrication as defined in Policy VIII.3.1."

Allegation 1.2: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations of a paper by reproducing illustrations in a paper entitled "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

Allegation 1.2a: Fig. 14 shows the same optical micrograph of a pure copper chip as published in allegation 1b above which is an image from the authors' work published by the authors in Brown et al. (2002) [1]. The caption for Fig. 14 identifies the materials as "copper," whereas the text incorrectly refers to it as "brass." The caption states that the figure is provided "(Courtesy S. Chadrasekara)," Note the misspelling of Chandrasekar. The authors are not aware that Jackson ever asked them for permission to publish any of their original work and if such permission had been requested it certainly would not have been granted. Furthermore, there is no question that the copyright, and thus the right to grant permission to republish this particular figure, is held by J. Materials Research, and not the authors. No source for this previously published figure is given anywhere in the Jackson paper.

"If found to be true, this allegation would satisfy the definitions of plagiarism and fabrication in Policy VIII.3.1."

Allegation 1.2b: Fig 15 shows two images of titanium chips produced by the authors. Both images, as published by Jackson, are digitally compressed in the horizontal direction. The left image shows a titanium "quick-stop" dark-field optical micrograph, which has not been published yet by the authors, but has appeared in presentations based on the original work of Dr. Bala Rao[8], a former post-doc under the direction of Prof. Chandrasekar. The right image, also the authors' work, is a TEM image of a titanium chip, which has been published by the authors in Swaminathan et al. [2]. The version of this image published by Jackson containing superimposed white arrows, however, suggests that it was taken from one of the authors' presentation slides. [3-6] No reference to the source of these images is provided anywhere in the Jackson paper.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.3: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations in article entitled **"Manufacture of nanocrystalline metals by machining processes," by M. J. Jackson, G. M. Robinson, and M. D. Whitfield published in the Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.**

Allegation 1.3a. Fig. 3 shows the same micrograph as published by Jackson in 1b and 2a, which is a digitally altered version (stretched vertically) of an image from the authors' work published by the authors in Brown et al. (2002) [1]. No source for this previously published figure is given anywhere in the Jackson paper. The description of Fig. 3 in the text identifies the material incorrectly as "brass."

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.3b. Fig 4 shows two images of titanium chips produced by the authors. These are the same images as published by Jackson in 2b, albeit digitally distorted. Again, no source for these images is provided anywhere in the paper. The hardness value (535 HV) appearing in the figure caption is incorrect and inconsistent with the value given by Jackson in the text (585 kg/mm²), which is also incorrect. The values given in the text (Experimental results and discussion section) for nanoindentation of the chip (585 kg/mm²) compared to the bulk (245 kg/mm²) do correspond exactly to the authors' published results from measurement on the nickel-based alloy Inconel.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.3c. The Acknowledgements section thanks Srinivasan "Chandrasekara" ("Chandrasekar" misspelled) and James Mann, "for providing the use of laboratories and technical support in the Michael Golden laboratories." Neither access to the laboratories nor technical support was provided, or authorized by the authors.

"If found to be true, allegation 1.3c would represent fabrication as defined in Policy VIII.3.1."

Allegation 1.4: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations in book chapter 12 entitled "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

Allegation 1.4a: Fig. 12.27 shows the same Brown et al. (2002) [1] image, as in 1b, 2a and 3a, again stretched vertically, but to a lesser aspect ratio than in 3a. The copyright to this previously published image is held by Journal of Materials Research, not the authors.

"If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4b: Fig. 12.28 shows four TEM images from the authors' work, which are the same images published by Jackson in 1c.

"If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4c: Fig. 12.29 shows four TEM images taken from the authors' work showing pure aluminum chip microstructure produced at different shear strain levels. These images were presented by the authors in posters and oral presentations, but were not published by the authors. Note that the figure labels and accompanying text in the left margin is identical with that on slide 6 of the Leeds-Lyon Tribology Symposium presentation given by the authors [3].

"If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4d: Fig. 12.30 shows a column chart of Hardness in "Bulk" and "Nano" forms of thirteen different alloys. This chart was created by the authors, based on their experimental measurements. It has appeared in several of the authors' conference presentations, but had not been published by the authors.

"If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4e: Fig. 12-31 contains three images from the authors' work. One image shows an early modulation-assisted machining device developed by the authors in the authors' lab and which is currently being commercialized by . This device is similar to, but different than, the device shown in the image published by Jackson in 1e. Images of this device have been shown in posters and presentations given by the authors, but they had not been published, pending patenting and commercialization. Fig. 12.31 also shows images of continuous chips produced by "conventional turning" and particles produced by "turning with modulation" (material not identified). These images also have been presented by the authors in posters and presentations given by the authors, but have not been published by the authors. Note the layout and labeling of these pictures is identical with that on slide 9 of the Leeds-Lyon Tribology Symposium presentation given by the authors [3]. No acknowledgement or reference for the source of these three images is given in the caption.

"If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4f: Fig. 12-32 shows three image frames from a movie produced by the authors in the authors' lab showing chip formation with and without modulation. See slide 11 of the Leeds-Lyon Tribology Symposium presentation [3]. These images have not been published by the authors.

"If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4g: Fig. 12.33 shows five micrographs of chip particles produced by the authors using modulation-assisted machining. The dimensions of the particles are also given. The images have not been published by the authors. Labeling of the images is in a format identical to that used by the authors in a presentation at the Leeds-Lyon Tribology Symposium in 2005 [3].

"If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.4h: Fig. 12.34 is similar to Fig. 12.33, showing six micrographs of chip particles produced by the authors in the authors' lab, labeled with modulation-assisted machining conditions used to produce the particles. Labeling of the images is in a format identical to that used by the authors in a presentation at the Leeds-Lyon Tribology Symposium in 2005 [3].

"If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1."

Allegation 1.5: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the paper M. J. Jackson, M. D. Whitfield, J. S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008. Received 20 June 2007; accepted in revised form 6 August 2007.

Allegation 1.5a: Fig. 3 shows the "quick-stop" copper optical micrograph from Brown et al. (2002) [1] with "(Brown et al., 2002)" referenced in caption. This is the same micrograph published by Jackson in 1.1b, 1.2a, 1.3a, and 1.4a.

"If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1."

Allegation 1.5b: Fig.4 shows the same four images of the authors' work as published by Jackson in 1.1c and 1.4b. The caption falsely attributes the images to "(Brown et al., 2002)."

"If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1."

Allegation 1.5c: Fig. 5 is the same bar chart from the authors' work that was published by Jackson in 1.1d. It is attributed falsely as having appeared in "Brown et al. (2002)".

"If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1."

Allegation 1.5d: Fig. 6 shows a photograph of "Specially developed oscillating tool attached to piezoelectric oscillator located within machining centre." This is the same image published by Jackson in 1.1e showing an early MAM device produced by the authors in the authors' lab and is different from that published by Jackson in 4e. Again, this is an early prototype of a patented product now licensed to . No reference for this photograph is provided anywhere in the paper.

"If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1."

Allegation 1.5e: Fig.7 shows continuous chips and particulate produced using modulation; these are the same images published in 1.1f and 1.4e. The caption incorrectly describes the continuous chips as produced with modulation and the discontinuous chips (particles) as produced without modulation. The caption falsely attributes the pictures to "(Brown et al., JMR, 2002)." These pictures, which are the authors' original work, have not been published

by the authors

"If found to be true, this allegation satisfies the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.5f: Figs. 14-21 show frames from a movie produced by the authors in the authors' lab showing machining of lead with a negative rake angle tool. No reference of any sort is provided for these images, which have not been published yet by the authors in any form (movie or still frames). The movie in which these frames appear can be provided upon request. The movie was made by doctoral student _________, as part of his PhD research under the direction of __________. The third image in the series (Fig. 16) is printed backwards. Neither the Results nor Discussion of Figs. 14-21 make any mention of what material is being cut in the images. The Experimental Procedures section describes experiments on lead and tin and includes a table showing results for cutting of lead and tin using tools with various rake angles of -5 to -23 degrees. The images from the movie of the authors' work on cutting of lead clearly show a tool having a rake angle of -35 degrees, which is outside the range of tool angles described anywhere in the Jackson paper.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.6: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the paper M.J. Jackson, J. S. Morrell and W. Ahmed, "Shear strain induced formation of nanostructured pure metals," *International Journal of Nanoparticles*, Volume 1, Number 1, pp. 271-282,2008.

Figs. 7-14 of this paper are the same set of frames from the authors' movie that were published by Jackson in Figs. 14-21 in paper 5 above. Again there is no reference to the source of these images. Again, the third image in the series (Fig. 9) is printed backwards, as in 1.5f. Again there is no mention of the material being cut in these images in the Results or Discussion sections. Furthermore, the experimental procedure is word-for-word the same experimental procedure as paper 5, except the diameter of the cutting tool changed from 950 μ m to 750 μ m and the two metals changed from tin and lead to iron and copper. The three tool rake angles used for cutting each of these metals (six tool angles total) also changed, each by one degree.

"If found to be true, allegation 1.6 would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 17: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the paper M.J. Jackson and M.D. Whitfield and W. Ahmed, "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp.326-341, 2009.

Allegation 1.7a: This article is largely a repeat of paper 6 above. Fig. 3 shows the same four TEM images from the authors' work published by Jackson in le, 4b and 5b, and falsely attributed

to Brown et al. (2002) [Complainant Reference 1].

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.7b: Figs. 9-12 are selected frames from the same movie of the authors' work published by Jackson in paper 5 and paper 6 above, again without any reference. The figure captions do not indicate what metal is being cut in the images, but the text in Section 4.2 does correctly identify the metal as lead.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.7c: The Experimental procedure section is word-for-word the same as the Experimental section in paper 5, except the two metals changed to titanium and tin. The corresponding results in Table 1 for tin are identical to the results for tin in Table 1 in paper 5 (three different values for each of five different parameters or measurements). The results for titanium, however, show the rake and shear plane angles changed by one degree each from the values for lead in Table 1 of paper 5, whereas each of the corresponding nine measurement values is identical to the values given for lead in Table 1 of paper 5.

"If found to be true, allegation 1.7c would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the book chapter M. J. Jackson and J. S. Morrell, Editors, Machining with Nanomaterials (2009), Springer, New York, NY. *Chapter 9: Formation of Nanostructured Metals by Machining*, M. J. Jackson, J. J. Evans, C. Xu and W. Ahlmed, pp. 297-323.

Allegation 1.8a: Fig. 9.3: same as in 1.1b, 1.2a, 1.3a, 1.4a and 1.5a.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8b: Fig. 9.4: same as in 1.1c, 1.4b, 1.5b and 1.7a, falsely attributed to Brown et al. (2002) [Complainant Reference 1] and published without permission.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8c: Fig. 9.5: same as 1.1d and 1.5c, falsely attributed to Brown et al {2002) and published without permission.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8d: Figure 9.6: same as 1.1e and 1.5d, with no reference given and published

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without permission.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8e: Fig. 9.7: same as 1.1f, 1.4e and 1.5e, falsely attributed to Brown et al. (2002) and published without permission.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8f: Figs. 9.14-9.21: same 8 frames of the authors' movie published in 1.5f and 1.6.

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 1.8g: Section 9.2.2 starting on p. 304 opens with plagiarism by paraphrasing the beginning of Brown et al. 2002. From the second paragraph on p. 304, there is word-for-word and paraphrasing plagiarism of paragraph 6 of Brown et al. (2002).

"If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1."

Allegation 2.1

It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text of a paper by Milton C. Shaw entitled "The size effect in metal cutting" published in Sadhana, Vol. 28, Part 5, October 2003, pp. 875-896, by reproducing this text verbatim or nearly verbatim in a chapter entitled "The Size Effect in Micromachining," Milton C. Shaw and Mark J. Jackson, Chapter 4 in <u>Microfabrication and Nanomanufacturing</u>, Mark J. Jackson, editor, CRC Press (Taylor and Francis), Boca Raton, FL, 2006, pp. 87-109.

Allegation 2.2

It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text of a paper by Milton C. Shaw entitled "The size effect in metal cutting" published in Sadhana, Vol. 28, Part 5, October 2003, pp. 875-896, by reproducing this text verbatim or nearly verbatim in a chapter entitled "Meso-Micromachining," Chapter 4 in <u>Micro and Nanomanufacturing</u>, Mark J. Jackson, Springer Science + Business Media, LLC, New York, NY, 2007, pp. 143-190.

"If found to be true, allegations 2.1 and 2.2 would satisfy the definition of plagiarism in Policy VIII.3.1."

V. Evidence Considered by the Investigation Committee

An inventory of all evidentiary documents considered by the Investigation Committee in its deliberations is presented in Appendix II.

VI. Findings of the Investigation Committee

A. Prologue

The publications considered in this case included several figures/images that each appeared in multiple publications. In addition to the specific information contained in an individual publication, the Committee also considered how a given figure was represented in various papers, including the parameters stated for the experimental conditions/materials. In addition, a table presenting a specific set of parameters also appeared in various publications, with the data in each publication represented as values for the specific set of materials described in the corresponding publication. Values for a given parameter were compared for various papers, in order to evaluate how that parameter varied from material to material.

Consideration of the various descriptions and contexts for a given image/figure provided insights into patterns of behavior. In several instances, the experimental parameters (material, machining time, etc.) were different in various publications, even though the image presented in the figure was identical. These inconsistencies of use were deemed highly relevant to the Committee, in terms of determining whether the presentation of work by other authors was intentional and in evaluating aspects of potential Falsification and Fabrication, in addition to Plagiarism.

The respondent presented two distinct versions of events related to the publications in question.

Version 1. In written responses in 2010 and 2011, the Respondent stated that the publications in question in Allegations 1.1-1.8 contained work performed by Jackson and co-authors. The Respondent made no indication at this time of any 3rd party being involved in the generation or submission of the associated manuscripts, nor description of e-mail security issues. The Respondent did not mention the letter that was allegedly submitted to the Provost in 2010. In those responses, the Respondent attributed the underlying research and preparation of various figures and images in question in Allegations 1.1-1.8 (including the series of video frames) to Professor Chandrasekar, his students or collaborators. For at least a portion of these images, electronic versions of the images were obtained by Jackson from James Mann.

This version of events is generally consistent with:

- i) Statements made by and Professors
- and
- ii) Information obtained from inspection of the video generated by which indicated that was the original source of the video frames in publications considered in Allegation 1.5-1.8.
- iii) Documents submitted by Jackson in 2011, which clearly indicate that Jackson was aware of the paper by Milton Shaw prior to publication in Sadhana and that

Jackson was aware of the book submission to Springer. These documents also indicate that Grant Robinson, acting on behalf of Mark Jackson, was involved in requesting permission for re-use of figures from various publications.

iv) A timeline of events based on dates of relevant conference presentations and publications in question as well as information obtained via documents and interviews.

Version 2. In the July, 2015, written responses and November, 2015, interview, the Respondent stated that the publications in question in Allegations 1.1-1.8 were submitted by a 3rd party without the knowledge of Jackson or co-authors. In this version of events, the 3rd party had access to data on computers used by Jackson's group as well as to Jackson's email account (allowing the 3rd party to intercept and delete email messages from journals/publishers). In this version, the information obtained from consisted of previously published papers, and was not directly used in publications. In the 2015 version of events, Jackson was not aware that Milton Shaw had submitted a paper to Sadhana, nor was Jackson aware that a book listing Jackson as author was being published by Springer.

The 2015 version of events was difficult to correlate with other information available to the Committee, based on:

- Jackson's claims that he was not aware of Milton Shaw's Sadhana paper nor the Springer book are inconsistent with information in documents provided by Jackson in 2011. The 2011 documents clearly indicate that Jackson was aware of both the Sadhana publication and the Springer book, in advance of the respective publication dates.
- ii) The timeline of events presented by Jackson in 2015 is inconsistent with the timeline of events developed by the Committee in several important aspects, including the date stated by Jackson during his interview by the Committee for the initial meeting with Peter Dunn (March 31, 2006, which pre-dated all of the publications, which are the subject of the allegations under consideration).
- iii) In spite of Jackson's claims related to communications with publication offices for the journals/publishers associated with the publications in question, the Respondent has submitted no documents related to communications between Jackson and the respective offices to this Committee.
- iv) For two of the publications in question (Allegations 1.1 and 1.2), Jackson served as both general chair and publications chair for the associated conference, and Jackson was co-editor of the proceedings. It seems unlikely that a conference proceedings could include two articles by a co-editor without that co-editor's knowledge.
- v) Jackson's 2015 description of items provided by is inconsistent with information provided by as well as written statements from Jackson in prior responses.
- vi) Jackson's 2006 Promotion/Tenure document lists the Springer book, and Jackson's 2010 Summary of Accomplishments lists a Chinese re-printing of this book.

- vii) Jackson's statements during the November 2015 interview indicated that he listed publications 1.1-1.8 on his CV and annual Summary of Accomplishments during periods between 2006 and 2010.
- viii) Jackson's claim of reporting concerns about email security and unauthorized submission of papers and books is inconsistent with information obtained in interviews and responses from the Research Integrity Officer and the former Dean of the College of Technology.

As part of his 2015 responses, Jackson stated that he submitted a set of allegations against

, et al. prior to the receipt of the allegations against Jackson (i.e. the subject of this investigation). No corroborating evidence is available indicating that Jackson submitted such a set of allegations. Even if Jackson's claim of filing a set of allegations were true, this claim was deemed to be immaterial to the present case. An allegation would not, by itself, constitute proof of specific facts in the present case. Since no evidence was presented indicating that the Complainants or other witnesses were aware of such allegations, there is no indication that the statements or documents provided by them have been influenced by any such allegations or were retaliatory.

Given the numerous inconsistencies between the version of events presented by Jackson in 2015 and the preponderance of other evidence available to the committee, as well as the lack of evidence to support Jackson's 2015 version of events, the Committee did not find the 2015 version of events to be credible. Therefore, the Committee placed significantly more weight on the responses and supporting documents provided by Jackson in 2010-2011.

B. Findings of Fact

Based on evidence and testimony available to date, the committee finds the following facts.

I. Facts associated with general aspects of the case and multiple allegations.

FF1-FF18: General findings of fact related to information obtained circa 2010.

FF I-1. Jackson provided an initial set of responses to the allegations (dated July 31, 2010, and sent by email August 2, 2010). Hereafter, this material will be denoted as "August 2, 2010 set of responses".

FF I-2. In the August 2, 2010 set of responses, Jackson stated that the publications in question in Allegations 1.1-1.3 and 1.5 were "based on work that was conducted by me and my associates."

FF I-3. In the August 2, 2010 set of responses, Jackson stated that the publication in question in Allegation 1.4 was a book chapter published by Jackson and his associates.

FF I-3. In the August 2, 2010 set of responses, Jackson stated that the publication in question in Allegation 1.6 "contains work performed by the authors and associates."

FF I-4. In the August 2, 2010 set of responses, Jackson stated that the publication in question in Allegation 1.7 "contains work performed by the authors and associates."

FF I-5. In the August 2, 2010 set of responses, Jackson stated that the publication in question in Allegation 1.8 was "a combination of the previously published works and is a book chapter."

FF I-6. In the August 2, 2010 set of responses, Jackson stated that "additional material" used in the publications in question in Allegations 1.1-1.5 was supplied by

FF I-7. In the August 2, 2010 set of responses, Jackson stated that had stated that Jackson could "use the material." (in reference to publications in question in Allegations 1.1-1.4).

FF I-8. In the August 2, 2010 set of responses, Jackson stated that material in the publication in question in Allegation 1.5 was "provided with permission by ."

FF I-9. In the August 2, 2010 set of responses, Jackson stated that "... it was assumed by the authors that the presentations were solely the work of supervised by . The authors accepted the fact that was the sole author of the presentations and that permission could be issued by alone." In this context, "authors" refer to Jackson and his co-authors, on publications in question in Allegations 1.1 and 1.2,

FF I-10. In the August 2, 2010 set of responses, Jackson stated that video frames in question in Allegation 1.5 were provided by . Jackson stated "The still images of machining with lead-tin were supplied by along with the presentation in 2006."

FF I-11. In the August 2, 2010 set of responses, Jackson stated that "If the incorrect images were supplied to the authors, then that cannot be attributed to the authors." This statement was in reference to the video frames in question in Allegation 1.5.

FF I-12. In the August 2, 2010 set of responses, Jackson stated that some of the material from presentations by Chandrasekar, et al. "incorporated the ideas of Jackson, Whitfield, Robinson...", referring to prior work while Jackson was at Tennessee Technological University. Jackson also stated that "based on this, it was assumed that the material could be used legitimately." These statements were made in reference to the photograph of the MAM device, presented in the publication in question in Allegations 1.1 and 1.2.

FF I-13. In the August 2, 2010 set of responses, Jackson stated that material in presentations by Chandrasekar, et al. was based on work by Jackson and associates. This statement refers to publication in question in Allegation 1.4.

FF I-14. In the August 2, 2010 set of responses, Jackson stated that the design of the MAM device was based on concepts developed by Jackson and associates prior to Jackson joining Purdue University and that Michael Whitfield had contributed to design drawing and manufacturing of the early MAM device. These statements refer to the device shown in photographs in publications in question in Allegations 1.1 and 1.5.

FF I-15. In the August 2, 2010 set of responses, Jackson stated that recordings and data used for publications in question in Allegations 1.5-1.7 were located in the Michael Golden laboratories, and that neither Jackson nor his co-authors had access to this laboratory.

FF I-16. Marcel Dekker was purchased by Taylor and Francis in 2005. Another Taylor and Francis division, CRC press, was the eventual publisher of the book chapter cited in Allegation 2.1.

FF I-17. Mark Jackson is listed as the editor of the 2006 CRC Press book.

FF I-18. Mark Jackson is listed as the sole author of the 2007 Springer book.

FF19-FF23: General findings of fact related to publication listed in Allegation II.

FF I-19. On February 28, 2011, Purdue's Research Integrity Officer requested a response from Jackson regarding Allegation II.

FF I-20. Jackson submitted a set of responses by email on March 27, 2011.

FF I-21. The March 27, 2011 set of responses contained a re-statement of the responses provided by Jackson in his Aug. 2, 2010 set of responses, and the pages were marked with the same date as the Aug. 2, 2010 responses (i.e. July 31, 2010).

FF I-22. The March 27, 2011 set of responses also included statements related to Allegation II.

FF I-23. In the March 27, 2011 set of responses, Jackson stated that publications listed in Allegation II were "joint publications by M.C. Shaw and M. J. Jackson (referring to Milton Shaw and Jackson).

FF24-FF33: General findings of fact related to the publication listed in Allegation II.1.

FF I-24. In the March 27, 2011 set of responses, Jackson stated that the Sadhana paper entitled "Size Effects in Metal Cutting" was a joint effort by "the authors" (referring to Milton Shaw and Jackson).

FF I-25. In the March 27, 2011 set of responses, Jackson stated he and "Prof. Shaw" (referring to Milton Shaw) were asked in 2002 to submit a joint paper to a special issue of Sadhana.

FF I-26. In the March 27, 2011 set of responses, Jackson stated that Jackson wrote to Milton Shaw in 2002, suggesting a plan for the joint paper and that Shaw replied to Jackson "agreeing on its format and structure."

FF I-27. In the March 27, 2011 set of responses, Jackson stated that the paper was submitted and published without Jackson listed as co-author.

FF I-28. In the March 27, 2011 set of responses, Jackson stated that he subsequently asked Milton Shaw for permission to use the paper as a book chapter, and that Shaw "agreed to its republication with the agreement to co-author and to focus on the emerging area of micromachining."

FF I-29. In the March 27, 2011 set of responses, Jackson stated that the book entitled "microfabrication and nanomanufacturing" was based on material that was scheduled to be presented at an ASME MEMS forum in 2003. The MEMS course was cancelled due to lack of attendance, and the book was published as a professional handbook.

FF I-30. In the March 27, 2011 set of responses, Jackson stated that the book entitled "microfabrication and nanomanufacturing" was initially intended to be published by Marcel Dekker, and that Marcel Dekker was sold to CRC Press during the writing of the book.

FF I-31. In the March 27, 2011 set of responses, Jackson stated that Jackson asked Grant Robinson to request permissions from Indian Academy of Sciences for re-use of figures from the Sadhana paper.

FF I-32. In the March 27, 2011 set of responses, Jackson stated Grant Robinson obtained permission from Indian Academy of Sciences to "reproduce the paper in its entirety with the modified title."

FF I-33. In the March 27, 2011 set of responses, Jackson stated that CRC Press book was published in the fall of 2005.

FF34-FF36: General findings of fact related to the publication listed in Allegation II.2.

FF I-34. In the March 27, 2011 set of responses, Jackson stated that he was asked by Springer in 2004 to compile a textbook for a course on micro and nanomanufacturing. Jackson also stated that this material was intended for students of the MET 490N (later MET446) course.

FF I-35. In the March 27, 2011 set of responses, Jackson stated permissions were gained from authors of the previous book (referring to book published by CRC Press).

FF I-36. In the March 27, 2011 set of responses, Jackson stated that Jackson asked Grant Robinson to request permissions from "primary sources."

FF37-FF63: General findings of fact related to documents submitted by Jackson, circa 2011.

FF I-37. In a letter from Jackson to Milton Shaw, dated May 29, 2002, Jackson states that Prof. V.C. Venkatesh has suggested that Jackson and Shaw prepare a joint paper for a "forthcoming special volume of the Proceedings of the Indian Academy of Sciences."

FF I-38. In a letter from Jackson to Milton Shaw, dated May 29, 2002, Jackson states several potential topics for the paper, and makes a request that Shaw clarify an issue related to the von Mises criterion.

FF I-39. In a letter from Milton Shaw to Jackson, dated September 1, 2002, Shaw acknowledges receipt of Jackson's May 29, 2002 letter "regarding the publication of a joint paper to the Proceedings of the Indian Academy of Sciences.

FF I-40. In a letter from Milton Shaw to Jackson, dated September 1, 2002, Shaw states that he is enclosing a manuscript for Jackson's consideration.

FF I-41. In a letter from Milton Shaw to Jackson, dated September 1, 2002, Shaw asks Jackson to for his "full affiliation so that it can be included in the journal."

FF I-42. In a letter from Milton Shaw to Jackson, dated September 1, 2002, Shaw states that he has "added a section on inhomogeneous strain and explained the problems associated with using the von Mises criterion..."

FF I-43. In a letter from Milton Shaw to Jackson, dated September 1, 2002, Shaw states that once he receives Jackson's information (referring to affiliation details and comments on the manuscript), Shaw will send the manuscript to V. C. Venkatesh.

FF I-44. A copy of a manuscript entitled "The size effect in metal cutting" has also been provided to the committee. The manuscript lists Milton C. Shaw and M. J. Jackson as co-authors. Jackson's affiliation (Tennessee Tech) is hand-written on the manuscript.

FF I-45. Copies of two email exchanges between Grant Robinson and G. Madhavan, Executive Secretary for Indian Academy of Science, dated September 18-19, 2005, have been provided to the committee.

FF I-46. The first email exchange of September 18-19, 2005 between Grant Robinson and G. Madhavan is in regard to Microfabrication and Nanomanufacturing, CRC Press, Dr. Mark Jackson.

FF I-47. According to the copies provided to the committee, the two emails from Grant Robinson to G. Madhavan were both sent on September 18, 2005. The time does not appear in the forwarded email header.

FF I-48. According to the copies provided to the committee, the two emails from G. Madhavan to Grant Robinson were both sent on September 19, 2005 at 5:06 am. The time on the email header specifies time to the nearest minutes.

FF I-49. According to the copies provided to the committee, the text of the two emails from Grant Robinson to G. Madhavan were identical, except for two lines specifying the intended title and publisher, and a change in expected publication date (October 2005 versus October 2006).

FF I-50. According to the copies provided to the committee, the text of the two emails from G. Madhavan to Grant Robinson were identical, except for omission of a sentence pointing out that the original paper was a single-author paper (in the second email).

FF I-51. In his first September 18, 2005 email, Grant Robinson requests permission to use "figures from one of your publications" and refers to "M.C. Shaw and M. J. Jackson, Size effects in Metal Cutting, Proc. Indian Academy of Sciences, "Sadhana", October 2003, Indian Academy of Sciences."

FF I-52. In his first September 18, 2005 email, Grant Robinson states that permission is being requested for use in Microfabrication and Nanomanufacturing, CRC Press, Dr. Mark Jackson, and states an expected publication date of October 2005.

FF I-53. In his first September 19, 2005 email response, G. Madhavan states that the Indian Academy of Sciences "permits you to use in your forthcoming book the figures which appeared in the article published in our journal SADHANA, October 2003."

FF I-54. In his first September 19, 2005 email response, G. Madhavan states that the reference provided by Grant Robinson was incorrect, in that the Sadhana paper was a single author article by Milton C. Shaw.

FF I-55. A permission request form has also been submitted to the Committee. The form is dated October 24, 2004, is addressed to Executive Secretary, Indian Academy of Sciences and is from Grant M. Robinson, on behalf of Dr. Mark J. Jackson.

FF I-56. The permission request form states "Permission is requested on a nonexclusive basis to reproduce the following material for use in this and all subsequent editions of the literary work described below.... The original source will be acknowledged."

FF I-57. The permission request form states that the material being requested is "Size effects in metal cutting, Proc. Indian Academy of Sciences, SADHANA, October 2003, by M. C. Shaw and M. J. Jackson, vol 28, pp. 875-896, to be published as "size effects in micromachining."

FF I-58. The permission request form lists the intended publication as "Jackson, MEMS Microfabrication and Nano-Manufacturing." The form indicates that the book will be published by Marcel Dekker.

FF I-59. The form is signed and dated December 21, 2004, indicating granting of permission (signature is illegible).

FF I-60. The second email exchange of September 18-19, 2005 between Grant Robinson and G. Madhavan is in regard to Micro and Nanomanufacturing, Springer Press, Dr. Mark Jackson.

FF I-61. In his second September 18, 2005 email, Grant Robinson requests permission to use "figures from one of your publications" and refers to "M.C. Shaw and M. J. Jackson, Size effects in Metal Cutting, Proc. Indian Academy of Sciences, "Sadhana", October 2003, Indian Academy of Sciences."

FF I-62. In his second September 18, 2005 email, Grant Robinson states that permission is being requested for use in Microfabrication and Nanomanufacturing, CRC Press, Dr. Mark Jackson, and states an expected publication date of October 2006.

FF I-63. In his second September 19, 2005 email response, G. Madhavan states that the Indian Academy of Sciences "permits you to use in your forthcoming book the figures which appeared in the article published in our journal SADHANA, October 2003."

FF64-FF65: General findings of fact related to questions posed by the committee to Jackson in June, 2015.

FF I-64. In June, 2015, the Committee provided a set of questions to Jackson, along with a request that Jackson respond in writing. The questions included a request for information regarding the roles of Jackson and his co-authors in various publications (including publications included in Allegations 1.1-1.8). The questions also included a request for evidence relevant to the investigation.

FF I-65. The set of questions was sent by email to Jackson on or about June 25, 2015.

FF66-FF88: General findings of fact related to set of responses submitted by Jackson on July 20, 2015.

FF I-66. On or about July 20, 2015, Jackson provided a set of responses to the questions posed by the committee, referring to "questions provided by the Investigating Committee on June 26, 2015.

FF I-67. The July 20, 2015 response from Jackson is marked as "Submitted by Mark J. Jackson, June 20, 2015." This set of responses will be referred to as the "July 20, 2015" responses.

F I-68. In the July 20, 2015 response, in reference to Question 1 and the publications in question in Allegations 1.1-1.8, Jackson stated that all data generated including samples of samples and notebooks were submitted to the "Chief Integrity Officer at Purdue University."

FF I-69. In the July 20, 2015 response, in reference to the publications in question in Allegations 1.1-1.8, Jackson stated that concepts in patents filed by the Chandrasekar team were developed by Jackson during his employment at Unicorn Abrasives between 1995 and 1996, and in subsequent work by Jackson.

FF I-70. In the July 20, 2015 response, in reference to the publications in question in Allegations 1.1-1.8, Jackson stated that "papers using this data were published by Chandrasekar and his team under the names of Jackson and co-authors."

FF I-71. In the July 20, 2015 response, in reference to the publications in question in Allegations 1.1-1.8, Jackson stated that "the papers published based on the data generated by my research team were not authorized by me or by my co-authors."

FF I-72. In the July 20, 2015 response, in regard to questions related to the acquisition of data in the publications in question in Allegations 1.5-1.7, Jackson stated that the dates, times, personnel involved and equipment used was logged in detail in the notebooks provided to the Chief Integrity Officer.

FF I-73. In the July 20, 2015 response, in regard to questions related to the acquisition of data in the publications in question in Allegations 1.5-1.7, Jackson stated that a "collection of data logging equipment" was used, at Unicorn Abrasives' R&D Laboratory in Gloucester, England, Cavendish laboratory at the University of Cambridge, Michael Golden Laboratories and the advanced manufacturing research laboratory in Knoy Hall.

FF I-74. In the July 20, 2015 response, Jackson stated that Vitrified Technologies was an entity established by Jackson's brother in 2002, and that the company closed in 2004.

FF I-75. In the July 20, 2015 response, Jackson stated that, during his employment at Purdue, his equipment was located in a number of laboratories in Knoy Hall and the Michael Golden Laboratories. This included space in MGL 1208 with two Hurco CNC machine tools, Knoy 139, which was "dedicated to micromachining research and high speed photography after 2008" and a dedicated planning unit constructed after 2008.

FF I-76. In the July 20, 2015 response, Jackson stated that he had used the IE portion of the Michael Golden Laboratories prior to 2008 for high speed photography of planed materials, conventional machining with CNC machine tools modulated machining and metrology work.

FF I-77. In the July 20, 2015 response, referring to the laboratories described in the prior two FF's, Jackson stated "full access was provided in all laboratories in all of these laboratories..."

FF I-78. In the July 20, 2015 response, in reference to the Sadhana paper by Milton Shaw, Jackson stated "The paper that appeared in Sadhana started around 2001 when I asked Milton Shaw to co-edit a book chapter for CRC Press titled, "Microfabrication and Nanomanufacturing."

FF I-79. In the July 20, 2015 response, in reference to the Sadhana paper by Milton Shaw, Jackson stated that Jackson had started writing the outline of the paper and Milton Shaw edited and made suggestions regarding the addition of references to other works.

FF I-80. In the July 20, 2015 response, in reference to the Sadhana paper by Milton Shaw, Jackson stated "I was surprised to see the same work published as a paper in Sadhana after the CRC book was published..."

FF I-81. In the July 20, 2015 response, in reference to the Sadhana paper by Milton Shaw, Jackson stated that Milton Shaw should not have submitted the paper to Sadhana since Jackson and Shaw had an agreement to include it in the CRC book.

FF I-82. In the July 20, 2015 response, in reference to publication 2 listed in Allegation II, Jackson stated "Publication II-2. This is the book chapter that I worked on with Milton"

(referring to Milton Shaw) "since 2001. I submitted it without knowing that the Sadhana paper had been published by Milton Shaw alone."

FF I-83. In the July 20, 2015 response, in reference to publication 2 listed in Allegation II, Jackson stated "I was unaware of the publication in Sadhana at the time of publication of the CRC book, otherwise a full request to re-print would have been requested and my name removed from the CRC chapter."

FF I-84. In the July 20, 2015 response, in reference to publication 2 listed in Allegation II, Jackson stated that requests to use photographs and acknowledge sources were handled by Milton Shaw and Jackson "with a view to publish a joint work in the CRC book."

FF I-85. In the July 20, 2015 response, in reference to publication 2 listed in Allegation II, Jackson stated that a full list of correspondence with Milton Shaw had been submitted to the "Chief Integrity Officer," along with permission statements, on February 23, 2010.

FF I-86. In the July 20, 2015 response, in reference to publication 3 listed in Allegation II, Jackson stated "I did not ask for permission from Sadhana because I was unaware of this publication when I submitted the jointly-written chapter with Milton Shaw to the CRC book."

FF I-87. In the July 20, 2015 response, in reference to publication 3 listed in Allegation II, Jackson stated "Publication II-3. I did not authorize publication of this chapter. This appears to have (sic) submitted under my name without my permission."

FF I-88. In the July 20, 2015 response, in reference to publication 3 listed in Allegation II, Jackson stated "I did not authorize publication of chapter in the Springer book. I do not have any explicit permission notices from other authors to publish in the book. The book appears to have been submitted in my name without authorization."

FF I-89 In the July 20, 2015 response, Jackson stated that he submitted a set of allegations against Professors and co-workers in a letter dated February 23, 2010. A copy of a "cover letter" addressed to Provost Randy Woodson was included in the response.

FF I-90 In the July 20, 2015 response, Jackson stated that his alleged that patents filed by Professors and co-workers were "developed by" Jackson during his employment at Unicorn Abrasives between 1995 and 1996, and further developed following his employment at Unicorn.

FF I-91 In the July 20, 2015 response, Jackson stated that data, including samples and databooks were submitted "at that time" (presumably referring to Feb. 23, 2015) to the Chief Integrity Officer at Purdue University.

FF I-92 In the July 20, 2015 response, Jackson stated that complaints regarding unauthorized use of his email were lodged many times with his department head and the Technology computer network.

FF93-FF107: General findings of fact related to interviews with Complainants and other individuals with relevant information.

FF I-93. During interviews, Professor stated that neither Mark Jackson nor his coauthors contacted to discuss potential participation in the publications in question.

FF I-94. During interviews, Professor stated that neither Mark Jackson nor his coauthors contacted to discuss potential participation in the publications in question.

FF I-95. During interviews, Professor stated that neither Mark Jackson nor his coauthors contacted to discuss potential participation in the publications in question.

FF I-96. During interviews, Professor stated that neither Mark Jackson nor his coauthors had discussed the interpretation of the figures in question in Allegation I with

FF I-97. During interviews, Professor stated that neither Mark Jackson nor his coauthors had discussed the interpretation of the figures in question in Allegation I with

FF I-98. During interviews, Professor stated that neither Mark Jackson nor his coauthors had discussed the interpretation of the figures in question in Allegation I with

FF I-99. During interviews, Professor stated that neither Mark Jackson nor his coauthors had been given access to laboratories supervised by in Michael Golden Laboratories (MGL 1317 and 1331).

FF I-100. During interviews, stated that he had provided a compact disc to Mark also stated that the material included the video showing "side-view images" of machining.

FF I-101. During interviews, stated that Mark Jackson had requested permission for use of the material for educational purposes, and that had provided verbal permission for such use.

FF I-102. During interviews, stated that he had not trained Mark Jackson nor Jackson's students to operate equipment contained in MGL 1317 and 1331.

FF I-103. During interviews, stated that was the person who originally obtained the video images presented as Figures 14-21 in the publication in question in Allegation 1.5.

FF I-104. Jackson was provided with advance notice of interviews with the Complainants and , and informed that he or his legal representative could attend the interviews, in person or via telephone/video conference.

FF I-105. Jackson did not attend the interviews with Complainants and

FF I-106. Jackson was informed that he could review the transcripts of the interviews with Complainants and

FF I-107. The committee has not received comments from Jackson regarding the interviews with Complainants and

FF108-FF109: General findings of fact related to Preliminary Findings of Fact provided by Committee to Respondent on November 19, 2015.

FF I-108 The Committee provided preliminary findings of fact to Mark J. Jackson on November 19, 2015. The document, along with a cover letter, were delivered by registered process server.

FF I-109 On November 19, 2015, Jackson replied via email to the Research Integrity Officer. Jackson's response noted that statements from the July 20, 2015 responses, specifically regarding allegations allegedly made by Jackson on Feb. 23, 2010, were not mentioned in the Preliminary Findings of Fact.

FF110-FF164: General findings of fact related to interview with Respondent on November 21, 2015.

FF I-110 Mark J. Jackson was interviewed by the committee on November 21, 2015. The interview was conducted via Skype.

FF I-111 In a prepared statement starting the interview, the Committee referred to various documents and interviews that had been considered, including responses that had been received from Jackson in 2010, 2011 and 2015. Two sets of documents that had been provided to Jackson by the Committee were also described: the June, 2015 set of questions and the November, 2015 Preliminary Findings of Fact.

FF I-112 Prior to any formal questions, the Committee invited Jackson to present an opening statement. The Committee suggested that Jackson include contentions, points of rebuttal and any evidence that he would like the Committee to consider.

FF I-113. In an opening statement, Jackson stated that the one piece of material missing from the Committee's preliminary findings of fact was "the initial complaint that I had supplied to the provost, to the chief executive officer, which at the time was Provost Woodsen. This was dated 23rd of February, 2010 ... it was actually so much material that it was taken over to Hovde Hall by myself and by a student of mine called (indiscernible)."

FF I-114. Jackson stated that the material submitted on February 23, 2010 included "the cover letter, the materials that were associated with that. The physical materials which you have photographs of and then there is also the – an explanation of the grievance and all supporting materials that go with that. These would be copies of laboratory notebooks, copies of notes that were taken out by Professor and his associates and copies of account assign

invention disclosures which I had produced when I was employed by Unicorn Abrasives in 1995-96. And also letters that were written to former heads of department complaining about papers that had been published under my name that I had not submitted. And also there were a large number of computer disks." In follow-up questions, Jackson stated that he submitted "copies of invention disclosures, copies of the inventions that are being – that had been patented. I also submitted copies of papers that had been submitted and published in my name and that of my students. And I also submitted physical evidence such as notebooks, lab notebooks, filings, metal chips associated with the experimental work that I conducted, and a bunch of computer disks with information on it concerned with the experiments that I'd done, and the results that it brought".

FF I-115 Jackson stated that the materials were "handed over to the Provost's office that was on the second floor of Hovde Hall. And the – and all of the materials associated with the complaint was transported up to the third floor to Dr. Dunn's office."

FF I-116 Jackson stated that the boxes of materials were sealed in his presence.

FF I-117 Jackson stated that a copy of the documentation was also submitted to the general counsel of the company for which he had previously worked.

FF I-118 Jackson stated that the allegations made on February 23, 2010 included allegations that i) work Jackson had performed at Unicorn Abrasives had been used to file invention disclosures on behalf of Professor and his associates in the 2006 timeframe, and that ii) Jackson's email account and laboratory computers had been compromised, and that publications in Jackson's name had been submitted by someone else (including the 8 publications in question in Allegation 1 in this case).

FF I-119 Jackson stated that he had concerns regarding security of his email accounts. He stated that he met with his department head,

FF I-120 Jackson stated that he and met with Peter Dunn on March 31, 2006. He stated that the discussion included both concerns about email security and about publications being submitted in Jackson's name by someone else.

FF I-121 Jackson stated that at the March 31, 2006 meeting, "it was suggested that a complaint be filed, which is what I did with , and the Dean of Engineering and the Head of Industrial Engineering would be consulted on that. And a follow-up meeting was going to be planned between the two deans, the Dean of Technology and the Dean of Engineering." Jackson stated that he did not receive any notice that the meeting between the two deans had occurred.

FF I-122 Jackson stated that he was informed of the formal process to file an allegation of research misconduct, "... but I was told not to do that by my head of department. You know, let's just, you know, make the initial inquiries to see if there was a case to be made and then it would proceed to a formal complaint."

FF I-123 The March 31, 2006 meeting date cited by Jackson pre-dates the papers considered in Allegations 1.1-1.8, as well as the conference with which the proceedings papers (Allegations 1.1 and 1.2) were associated.

FF I-124 Jackson stated that in the 2007-2008 timeframe, while he was being considered for promotion to Full Professor, his interim department head (Tomavich) indicated that an external letter had raised questions about a number of Jackson's papers that had appeared more than once.

FF I-125 Jackson stated that the computer network staff in Technology confirmed that someone other than Jackson was accessing Jackson's email account, so Jackson changed his password.

FF I-126 Jackson stated that he was asked to keep the matter confidential by both Harden and Tomovich (department head and interim head, respectively).

FF I-127 Jackson stated that the publications in question in Allegations 1.1-1.8 and 2.2 were submitted by someone other than Jackson or his co-authors.

FF I-128 Jackson stated that the publications under consideration in Allegations 1.1-1.8 and Springer book considered in Allegation 2.2 were listed in his 2006 promotion document, CV and annual summaries of accomplishments, in spite of his understanding that the papers were submitted by someone else. He stated concerns about embarrassment in case he had to explain the situation to others and advice from department head to avoid disrupting an ongoing investigation.

FF I-129 Jackson stated that he was not aware of the articles in the conference proceedings for the 5th ASM International Conference (in which publications under consideration in Allegations 1.1 and 1.2) until after the proceedings appeared.

FF I-130 Jackson stated that he was contacted by a publisher with concerns whether a paper was published twice in two different symposia in late 2006.

FF I-131 Jackson stated that he had served in several roles for the conference and proceedings associated with the publications under consideration in Allegations 1.1 and 1.2. These roles included conference chair, symposium organizer for one or two topics, co-editor of the conference proceedings (with Prof. Ahmed). Jackson stated that he attended the conference and gave presentations at the conference.

FF I-132 Jackson stated that in late 2006, he was contacted by the publisher of the proceedings regarding two papers published under Jackson's name that contained comparable material.

FF I-133 Jackson stated that he subsequently wrote letters to the publisher regarding concerns about publications under his name that were not submitted by Jackson or co-authors.

FF I-134 Jackson stated that he believed that Professor and collaborators were responsible for submitting the publications in question in Allegations 1.1-1.8 and 2.2. Jackson stated that his evidence for this consisted of instances in which Jackson or his students observed

that the computers in the laboratory in the basement of Knoy had been turned on, and that and collaborators had access to those laboratories.

FF I-135-FF I-164: General findings of fact related to interview of Respondent.

FF I-135 Jackson stated that the paper under consideration in Allegation 1.3 was associated with a conference in Poland attended by Jackson. Jackson stated that the work was not intended to be published, and that it must have been submitted by someone other than Jackson or co-authors. Jackson stated that he first became aware of the paper after the publication appeared (approximately 6 months after the conference).

FF I-136 Jackson stated that he subsequently spoke with the editor-in-chief of the journal, informing him that Jackson had not submitted the paper.

FF I-137 Regarding the book chapter in question in Allegation 1.4, Jackson stated that chapter appeared in a book edited by Jackson and published by CRC Press in 2005. He stated that the chapters appearing in the Springer book were resubmitted without his knowledge to Springer.

FF I-138 Jackson stated that he had listed the Springer book in his summary of annual accomplishments submitted to his department head, in spite of his claim that he did not submit the work for publication. Jackson stated that he chose to list the publication in order to avoid embarrassment and in order to avoid questions related to the publications while an investigation was ongoing.

FF I-139 Jackson stated that he continued to list this publication on his summary of annual accomplishments even during the July 2010 to June 2011 timeframe, which would have post-dated his claimed submission of a research misconduct allegation on February 23, 2010.

FF I-140 Jackson stated that the publications in question in Allegations 1.5, 1.6, 1.7 and 1.8 were also submitted in his name by someone other than Jackson and co-authors.

FF I-141 Jackson stated that, in spite of being corresponding author on the publications, he never received email correspondence from the editorial offices regarding these publications. He stated that he assumed that someone was able to access his email messages and delete them before Jackson could access the messages.

FF I-142 Jackson stated that he had no recollection of submitting a set of responses to Professor Dunn on or about August 2, 2010. When read excerpts from those responses, Jackson stated that he had no recollection of making those statements.

FF I-143 Jackson stated that he had no recollection of submitting a second set of responses to Professor Dunn on or about March 27, 2011.

FF I-144 Jackson stated that he had no recollection of documents related to correspondence with journals seeking permission for re-use of figures in book chapters related to the CRC Press and

Springer books. He also stated that he had no recollection of Grant Robinson having requested permission to re-use figures for the CRC Press book nor for the Springer book.

FF I-145 Jackson stated that he had personally requested permissions to use figures in "Chapter 1, Chapter 3, Chapter 5, Chapter 8, 9, 10 and 14" in the CRC Press book.

FF I-146 Jackson stated that he had not received electronic versions of figures related to the publications in question from

FF I-147 Jackson stated that he had requested materials from James Mann for use in courses, "probably early in 2005." He stated that had provided "a few papers on grinding" which Jackson incorporated into his classes.

FF I-148 Jackson stated that he did not incorporate material supplied by into any publications.

FF I-149 At the end of the interview, several boxes of material were opened by legal counsel. The material in these boxes had been provided by Jackson to the Research Integrity Officer, and the boxes had been sealed until the November 21, 2015 event.

FF I-150 each item in the boxes were shown to Jackson (via the Skype video) and Jackson was asked to state the nature of each item and to indicate how the material was relevant to the case.

FF I-151 Jackson stated that the laboratory notebooks contained information related to work performed by Jackson prior to his position at Purdue. The laboratory notebooks indicated that the work was done at Cavendish Laboratories.

FF I-152. In addition, Jackson stated that a tool holder and tools were relevant to the current investigation.

FF I-153 For other samples and data discs in the boxes, Jackson stated that the material was not directly relevant to the current case.

FF I-154 Jackson identified the various materials in the boxes as end mills, samples of metal chips from Grant Robinson's Ph.D. work on investigating tool life, other machining tools, and floppy discs.

FF I-155 In boxes dated August 2, 2010, Jackson identified "copper filings or chips... mounted into a material that allows them to be polished so that you can view them under a microscope." He stated that these samples were part of the modulated assisted machining process. He stated that he recalled submitting these samples, and that they were submitted in response to a request to turn over experimental evidence. Jackson stated that he believed some of the images from the papers in question were taken from these particular set of samples.

FF I-156 In a box dated August 10, 2010, Jackson identified two notebooks from Cavendish Laboratories and a tool. He stated that the laboratory notebooks were submitted in order to show

that he had worked on developing the knowledge of modulated assisted machining that was independent of the work performed while he was an employee Unicorn Abrasives.

FF I-157 Regarding a box dated March 30, 2011, Jackson stated that he recalled submitting the box to Professor Dunn.

FF I-158 The box dated March 30, 2011 contained correspondence correspondence on Tennessee Tech University stationary over Jackson's signature, apparently original correspondence directed to Milton Shaw, and a set of documents entitled "Permission verifications."

FF I-159 Jackson stated that he recognized these documents, and that he had submitted them to Dunn "as part of the investigation in order to show that the CRC book had actually requested permission..."

FF I-160 The box dated March 30, 2011 also included a set of documents entitled "Figures and Tables", various email printouts and other documents consisting of faxes and additional printouts. Jackson stated that he could not confirm these documents without seeing them up close.

FF I-161 When asked if there were specific documents or pieces of evidence in those boxes that Jackson would like the committee to consider, Jackson stated that the two laboratory notebooks were the only pieces that he would like the committee to consider. He noted in particular pages that describe "my experimental work on modulated assisted machining." Jackson stated that this information was relevant in establishing that he had performed work on modulated assisted machining prior to the publications of the papers in question in this case.

FF I-162 In the November 21, 2015 interview, Jackson stated that, of the materials contained in the boxes, the materials of relevance for the current investigation were i) two laboratory notebooks from Cambridge University and ii) a tool holder and tools.

FF I-163 The other materials in the boxes included i) various samples of tools, substrates and filings/metal chips (most of which Jackson identified as related to PhD work of Grant Robinson) and ii) two floppy discs (Jackson was uncertain of the data contained on these discs). For the tools, substrates and filings, Jackson stated that he did not recall submitting those materials and that the materials were not relevant for the publications in question in the current investigation.

FF I-164 After the November 21, 2015 interview, the contents of the boxes were inventoried by legal counsel.

FF I-165-I-181 Refer to testimony by Peter Dunn, Research Integrity Officer, on November 21, 2015.

FF I-165 Professor Dunn stated that he had been Purdue's Research Integrity officer at all times since 2006, and that any allegation of a research integrity violation between 2006 and 2011 would have come to his attention.

FF I-166 Professor Dunn stated that he met with Mark Jackson on March 31, 2006. Dunn stated that his calendar indicated that he met with Jackson between 4:00 and 5:00 on that day, and that the meeting included only Jackson and Dunn.

FF I-167 Professor Dunn stated that that if he had received an allegation of research misconduct by Mark Jackson in March 2006, he would have notified the Provost of that allegation and notified in writing the individuals who were alleged to have committed research misconduct. This would have been followed up by the appointment of an inquiry committee.

FF I-168 Professor Dunn stated that he did not receive an allegation of research misconduct from Mark Jackson during the March 2006 meeting.

FF I-169 Professor Dunn stated that he also met with Mark Jackson in 2010, on more than one occasion. These meetings included meetings in conjunction with the allegations brought against Jackson, which are the subject of the current investigation.

FF I-170 Professor Dunn stated that he did not have meetings with Mark Jackson in 2010 regarding any research misconduct allegations other than the allegations under consideration in the current case.

FF I-171 Professor Dunn stated that he did not have any record or recollection of receiving any research misconduct allegations from Mark Jackson in the February 2010 timeframe.

FF I-172 Professor Dunn stated that the had an office on the 3rd floor of Hovde Hall in February 2010, and that there were no other persons with offices on the 3rd floor of Hovde Hall who had research integrity concerns under Purdue's Research Misconduct policy.

FF I-173 Professor Dunn stated that his calendar from February 23, 2010 did not contain a record of a meeting with Mark Jackson.

FF I-174 Professor Dunn stated that during the course of the current investigation, he had become aware of Mark Jackson's claim that Jackson had submitted on or about February 23, 2010 a research misconduct allegation to the Office of the Provost.

FF I-175 Professor Dunn stated that within the week prior to the interview, he had contacted the Provost Office and asked them to review their records from the time that Randy Woodson was Provost. The Provost responded that they were unable to find any record of such correspondence.

FF I-176 Professor Dunn also stated that he had reviewed his own records and was unable to find any records of such correspondence.

FF I-177 Professor Dunn stated that in the interval of 2005 to 2011, he was unaware of any security issue related to Mark Jackson's email accounts and that Mark Jackson had not indicated any related concerns in his correspondence by email or other documents.

FF I-178 Professor Dunn stated that he had provided receipts to Mark Jackson for all of the boxes of materials provided by Jackson (i.e. the boxes that were opened during the interview with Jackson).

FF I-179 Professor Dunn stated that he had no record of any other materials received from Jackson.

FF I-180 Professor Dunn stated that he had an archive of all email correspondence with Jackson in 2010.

FF I-181 Mark Jackson was connected via Skype during the interview. At the interview, Jackson was asked whether there were any follow-up questions for Dunn that he would suggest to the committee. Jackson stated that he had no questions.

FF I-182 to I-188 refer to Responses by , former Dean of the College of Technology at Purdue University, received December 9, 2015.

FF I-182 stated that he was not aware of any security issues with Professor Jackson's email account.

FF I-183 stated that he was not aware of any unauthorized access to laboratory computers by Professor Jackson or his students.

FF I-184 stated that he was not aware of allegations related to the current case until the Purdue Research Office initiated the Research Misconduct investigation.

FF I-185 stated that he was not aware of any discrepancies regarding authorship or ownership of publications submitted by Professor Jackson.

FF I-186 stated that before the official research misconduct investigation began, he was not aware of any issues related to ownership or authorship of publications submitted by Professor Jackson.

FF I-187 stated that after the investigation was initiated, Professor Jackson consistently denied any academic wrongdoing or misconduct.

FF I-188 stated that Professor Jackson did not return to his Purdue appointment the following year (following the start of the investigation).

FF I-189 to I-191 refer to Responses received from the Complainants in December, 2015.

FF 1-189 Regarding allegation 1.3, values for Inconel have been published in: "Large strain deformation and ultra-fine grained materials by machining," by Srinivasan Swaminathan, M. Ravi Shankar, Seongyl Lee, Jihong Hwang, Alexander H. King, Renae F. Kezar, Balkrishna C. Rao, Travis L. Brown, Srinivasan Chandrasekar, W. Dale Compton, Kevin P. Trumble, Materials Science and Engineering A 410–411 (2005) 358–363. FF I-190 A copy of the publication has been provided to the Committee.

FF I-191 Regarding values listed in "Table I" of the publications in question in Allegations 1.5-1.8, Prof. stated that it is unclear what parameters are represented by "mean lamellar spacing" and "chip curl", nor how they were measured, in light of a lack of pictures of "actual lamellae features or curled chips...". Prof. also noted that "substituting the reported parameters from Table 1 into Eq. (1) gives values for "chip curl" that are 4 times larger than those given in the table as "calculated chip curl..." As far as the Complainants are aware, there are no validated models for these types of parameters.

FF I-191 to I-192 refer to Annual Summaries of Accomplishments submitted by Jackson to his department head.

FF I-191 Jackson's "Faculty Annual Activity Report" for July 1, 2010 - June 30, 2011 listed two publications related to Allegation 2:

[']Microfabrication and Nanomanufacturing', Edited textbook by M. J. Jackson, published by CRC Press (Taylor and Francis Publishers), Published January 2006, fourteen edited chapters, 401 pages. *ISBN 0-8247-2431-3. Hardcover. Classified as a book in the subject area of Industrial and Manufacturing Engineering.*

'Micro and Nanomanufacturing', by Mark J. Jackson, Re-printed work of 'Micro and Nanomanufacturing', by Mark J. Jackson, Published with Permission from Springer Verlag by Science Press, China, June 2007, 699 pages, *ISBN 978-7-03-018243-2. Softcover*.

FF I-192 Jackson's "Faculty Annual Activity Report" for July 1, 2009 - June 30, 2010 listed the book containing the chapter under consideration in Allegation 1.8:
'Machining with Nanomaterials', Edited by Mark J. Jackson and J. S. Morrell, 372 Pages, 118 Illustrations, Published by Springer Series on 'Nanostructure Science and Technology'. 2009. *ISBN 978-0-387-87659-7. Hardcover. Classified as a book in the area of Nanotechnology*. The report also listed the CRC Press book described in Allegation 2.1:
'Microfabrication and Nanomanufacturing', Edited textbook by M. J. Jackson, published by CRC Press (Taylor and Francis Publishers), Published January 2006, fourteen edited chapters, 401 pages. *ISBN 0-8247-2431-3. Hardcover. Classified as a book in the subject area of Industrial and Manufacturing Engineering*.

FF I-193 to I-195 refer to Jackson's promotion document, circa 2006.

FF I-193 Jackson's promotion document listed "Jackson, M.J. (2005). *Microfabrication and Nanomanufacturing*, CRC Press (Taylor and Francis Publishing), New York and London."

FF I-194. Jackson's promotion document listed "Course text specially developed for the MET 490 course on 'Micro and Nanomanufacturing'. Submitted for publication to Springer Verlag Publishing in December 2005. To be published November 2006."

FF I-195 Jackson's promotion document lists a number of positions served by Jackson in the ASM 5th International Surface Engineering Conference and Exposition, Seattle, WA, May 2006,

including General Chair, Proceedings Co-Chairman, Member of Conference Organizing Committee, Conference General Session Chairman and Symposium Chairman (for 7 symposia).

II. Findings of Fact Related to Allegations 1.1-1.8

II.1 Allegation 1.1

Allegation 1.1: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations of a paper by the complainants by using word-for-word, paraphrasing, and style plagiarism, and reproducing illustrations in a paper entitled "**Surface Coatings Deposited Using Recycled Chips and Turnings**," M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

Allegation 1.1a: The introduction section of this paper includes word-for-word, paraphrasing, and style plagiarism of the authors' work published by the authors in Brown et al. (2002) Journal of Materials Research [1].

Allegation 1.1b: Figure 1 shows an optical micrograph of a pure copper chip, which is an image from the authors' work published by the authors in Brown et al. (2002) [1]. No source for this previously published figure is given anywhere in the Jackson paper.

Allegation 1.1c: Figure 2 shows a collection of four Transmission Electron microscopy (TEM) images described as a "collage," of four different alloys produced by the authors. This grouping of these images has not been previously published by the authors, although three of the four individual images have been published by the authors in Swaminathan et al. (2007) Journal of Materials Research [2]. All four of these micrographs have been presented together by the authors multiple times in various conference presentations. [e.g. 3-6] The caption of Fig. 2 names the four different alloys but does not distinguish which alloy corresponds to which micrograph. No source for these images is given anywhere in the Jackson paper.

Allegation 1.1d: Fig. 3 is a bar chart originally given in an oral presentation co-authored by
studentsand presented at an SAE Aerospace Conference in
October 2005 [4]. The figure subsequently appeared in the Master's Thesis of[7]
and had not been published by the authors. No source for this figure is given anywhere in the
Jackson paper.

Allegation 1.1e: Fig. 4 shows a photograph of an early Modulation-Assisted Machining (MAM) device produced by the authors in the authors' lab. This picture was taken by the authors and was presented by the authors at the SAE Aerospace Conference in October 2005 (see slide 14 in Ref [4]; the image in this Jackson paper appears to be a simple digital compression in the horizontal direction of the original image). This picture has not been published by the authors due to intellectual property implications. This device has been patented and licensed to . No reference to this photograph is provided anywhere in the paper.

Allegation 1.1f: Fig 5 shows two images of machining chips produced by the authors in the author's lab, labeled in the captions as having been produced "with and without" modulation using the device shown in Fig. 4. The figure caption does not distinguish which of the two pictures shows chips produced with modulation and which shows chips produced without modulation. These images also have been presented by the authors in posters and oral presentations [3, 4], but have not been published. No reference for the source of these images is provided anywhere in the paper.

Allegation 1.1g: The acknowledgements section of this paper thanks S. Chandrasekar and J. Mann "for use of equipments and facilities" The authors are not aware that Jackson used any facilities or equipment(s) in their lab.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF2 Refer to the introduction section described in Allegation 1.1a.

FF II.1-1. The wording in the material published by Mark Jackson, et al. was not identical to the work published in [ref 1] **Travis L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble entitled "Low-cost manufacturing process of nanostructured metals and alloys" which was originally published in the Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488.**

FF II.1-2. The article by Brown, et al. was not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF3-FF6 Refer to the figure described in Allegation 1.1b.

FF II.1-3. The figure in question in was originally published as FIG.1 page 2485 in [ref 1] **Travis** L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble, "Low-cost manufacturing process of nanostructured metals and alloys," Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488.

FF II.1-4. The figure in question was subsequently published as Figure 1. in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-5. The figure in question is not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-6. The figure reproduced from Brown, et al. was presented in a manner and context that indicated the figure was the original work of Jackson and co-authors.

FF7-FF14 Refer to the figures described in Allegation 1.1c.

FF II.1-7. The three of the four figures in question in were originally published as Fig. 12 page 1538 in [ref 2] Srinivasan Swaminathan, M. Ravi Shankar, Balkrishna C. Rao, W. Dale Compton, Srinivasan Chandrasekar, Alexander H. King, and Kevin P. Trumble, "Severe plastic deformation (SPD) and nanostructured materials by machining," Journal of Material Research, 4 January 2007, pp. 42:1529-1541.

FF II.1-8. The four figures in questions were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.1-9. The four figures in questions were originally included in a presentation entitled [ref 5] "Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble, and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.1-10. The four figures in questions were originally included in a presentation entitled [ref 6] "Nanostructured Materials by Large Strain Machining," by Srinivasan Chandrasekar, W. Dale Compton, Alex King, Kevin Trumble, and Thomas N. Farris, ARO-Purdue, April 2006. The presentation has not been published.

FF II.1-11. The two of four figures in questions were originally included in a presentation entitled [ref 8] "Consolidation of Nanocrystalline Material," by Balkrishma C. Rao, Purdue University, October 2005. The presentation has not been published.

FF II.1-12. The figures in question were subsequently published as Figure 2. in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-13. The figures in question are not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-14. The figures reproduced from Brown, et al. and from presentation by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF15-FF19 Refer to the bar chart described in Allegation 1.1d.
FF II.1-15. The bar chart in question was originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.1-16. The bar chart in question was originally included in a Master of Science Thesis entitled [ref 7] "Nanostructured Particulate by Modulation-Assisted Machining," Figure 7.20, page 73, Christopher J. Saldana, December 2006.

FF II.1-17. The bar chart in question was subsequently published as Figure 3. in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-18. The bar chart in question is not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-19. The bar chart reproduced from a presentation by Mann, et al. were presented in a manner and context that indicated the figure was the original work of Jackson and co-authors.

FF20-FF23 Refer to the figure described in Allegation 1.1e.

FF II.1-20. The figure in question was originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.1-21. The figure in question was subsequently published as Figure 4. in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-22. The figure in question is not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-23. The figure reproduced from a presentation by Mann, et al. were presented in a manner and context that indicated the figure was the original work of Jackson and co-authors.

FF24-FF28 Refer to the figure described in Allegation 1.1f.

FF II.1-24. The figure in questions was originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.1-25: The figure in question was originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.1-26. The figure in question was subsequently published as Figure 5. in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-27. The figure in question is not referenced in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-28. The figures reproduced from a presentations by Mann, et al. were presented in a manner and context that indicated the figure was the original work of Jackson and co-authors.

FF29-FF32 Refer to the acknowledgements section described in Allegation 1.1g.

FF II.1-29. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated "…Prof. Sullivan persuaded Prof. Chandrasekar to allow this [access to laboratory] to happen under his supervision.

FF II.1-30. Testimony from Professor , Professor , and Professor on May 8, 2015. Professor indicated that he did not give Mark Jackson permission to use the laboratories in question, "The two labs that I mentioned, 1331 and 1317, they [Jackson] are not authorized to use it.."

FF II.1-31. Testimony from Professor on May 8, 2015. stated "I'm not a person that grants authorization to the labs, if that's what you're asking. That's an administrative – that's above my level."

FF II.1-32. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the laboratory space which is the subject of this allegation.

FF33-FF36 Refer to the overall evidence and testimony related to Allegation 1.1.

FF II.1-33. The wording in the material published by Mark Jackson, et al. was not identical to the work published in [ref 1] **Travis L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble entitled**

"Low-cost manufacturing process of nanostructured metals and alloys" which was originally published in the Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488

FF II.1-34. For allegations 1.1b through 1.1f, the figures in question are not referenced or cited in M. J. Jackson, M. D. Whitfield, G. M. Robinson, and W. Ahmed, "Surface Coatings Deposited Using Recycled Chips and Turnings," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 155-160.

FF II.1-35. For allegations 1.1b through 1.1f, the figures reproduced from published work and unpublished presentations by the complainants and/or their students were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF II.1-36. For allegation 1.1g, the committee has not received conclusive evidence indicating Mark Jackson was given permission to use the laboratory space by Professor Chandrasekar.

II.2 Allegation 1.2

Allegation 1.2: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations of a paper by reproducing illustrations in a paper entitled "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

Allegation 1.2a: Fig. 14 shows the same optical micrograph of a pure copper chip as published in allegation 1b above which is an image from the authors' work published by the authors in Brown et al. (2002) [1]. The caption for Fig. 14 identifies the materials as "copper," whereas the text incorrectly refers to it as "brass." The caption states that the figure is provided "(Courtesy S. Chadrasekara)". Note the misspelling of Chandrasekar. The authors are not aware that Jackson ever asked them for permission to publish any of their original work and if such permission had been requested it certainly would not have been granted. Furthermore, there is no question that the copyright, and thus the right to grant permission to republish this particular figure, is held by J. Materials Research, and not the authors. No source for this previously published figure is given anywhere in the Jackson paper.

Allegation 1.2b: Fig 15 shows two images of titanium chips produced by the authors. Both images, as published by Jackson, are digitally compressed in the horizontal direction. The left image shows a titanium "quick-stop" dark-field optical micrograph, which has not been published yet by the authors, but has appeared in presentations based on the original work of Dr. Bala Rao[8], a former post-doc under the direction of Prof. Chandrasekar. The right image, also the authors' work, is a TEM image of a titanium chip, which has been published by the authors in Swaminathan et al. [2]. The version of this image published by Jackson containing superimposed white arrows, however, suggests that is was take from one of the authors'

presentation slides. [3-6] No reference to the source of these images is provided anywhere in the Jackson paper.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF10 Refer to the figure described in Allegation 1.2a.

FF II.2-1. The figure in question in was originally published as FIG.1 page 2485 in [ref 1] **Travis** L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble, "Low-cost manufacturing process of nanostructured metals and alloys," Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488.

FF II.2-2. The figure in question were subsequently published as Figure 14. in M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

FF II.2-3. The figure 14 in the Jackson, et al. paper includes "(Courtesy S. Chadrasekara)" in the figure caption. Chandrasekar is misspelled as Chadrasekara.

FF II.2-4. The figure in question is not referenced in M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

FF II.2-5. The figure 14 caption in Jackson, et al. refers to the material shown as copper. The text refers to material shown in figure 14 as brass.

FF II.2-6.Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.2-7. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.2-8. Testimony from Professor, Professor, andProfessoron May 8, 2015. Professortestified he did not giveMark Jackson permission to use any of the materials previously published, presented oraccessible through laboratory records.

FF II.2-9. The figure reproduced from Brown, et al. was presented in a manner and context that indicated the figure was not the original work of Jackson and co-authors.

FF II.2-10. The committee has not received conclusive evidence indicating Mark Jackson was given permission to publish the figure in question.

FF11-FF18 Refer to the figures described in Allegation 1.2b.

FF II.2-11. The right image in question in was originally published as Fig. 12 page 1538 in [ref 2] Srinivasan Swaminathan, M. Ravi Shankar, Balkrishna C. Rao, W. Dale Compton, Srinivasan Chandrasekar, Alexander H. King, and Kevin P. Trumble, "Severe plastic deformation (SPD) and nanostructured materials by machining," Journal of Material Research, 4 January 2007, pp. 42:1529-1541.

FF II.2-12. The right image in question was originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.2-13. The right image in question was originally included in a presentation entitled [ref 5] "Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble, and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.2-14. The right image in question was originally included in a presentation entitled [ref 6] "Nanostructured Materials by Large Strain Machining," by Srinivasan Chandrasekar, W. Dale Compton, Alex King, Kevin Trumble, and Thomas N. Farris, ARO-Purdue, April 2006. The presentation has not been published.

FF II.2-15. The left and right images in question were originally included in a presentation entitled [ref 8] "Consolidation of Nanocrystalline Material," by Balkrishma C. Rao, Purdue University, October 2005. The presentation has not been published.

FF II.2-16. The figures in question were subsequently published as Figure 15. in M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

FF II.2-17. The figures in question are not referenced in M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

FF II.2-18. The figures reproduced from Swaminathan, et al. and from presentation by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF19-FF21 Refer to the overall evidence and testimony related to Allegation 1.2.

FF II.2-19. For allegations 1.2a and 1.2b, the figures in question are not referenced or cited in M. J. Jackson, G. M. Robinson, M. D. Whitfield, R. G. Handy, W. Ahmed, and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," Proceedings of the 5th International Surface Engineering Congress, ASM International, May 15-17, 2006, pp. 210-215.

FF II.2-20. For allegations 1.2b, the figures reproduced from published work and unpublished presentations by the complainants and/or their students were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF II.2-21. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figures in question.

II.3 Allegation 1.3

Allegation 1.3: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations in article entitled "Manufacture of nanocrystalline metals by machining processes," by M. J. Jackson, G. M. Robinson, and M. D. Whitfield published in the Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

Allegation 1.3a. Fig. 3 shows the same micrograph as published by Jackson in 1b and 2a, which is a digitally altered version (stretched vertically) of an image from the authors' work published by the authors in Brown et al. (2002) [1]. No source for this previously published figure is given anywhere in the Jackson paper. The description of Fig. 3 in the text identifies the material incorrectly as "brass."

Allegation 1.3b. Fig. 4 shows two images of titanium chips produced by the authors. These are the same images as published by Jackson in 2b, albeit digitally distorted. Again, no source for these images is provided anywhere in the paper. The hardness value (535 HV) appearing in the figure caption is incorrect and inconsistent with the value given by Jackson in the text (585 kg/mm²), which is also incorrect. The values given in the text (Experimental results and discussion section) for nanoindentation of the chip (585 kg/mm²) compared to the bulk (245 kg/mm²) do correspond exactly to the authors' published results from measurement on the nickel-based alloy Inconel.

Allegation 1.3c. The Acknowledgements section thanks Srinivasan "Chandrasekara" ("Chandrasekar" misspelled) and James Mann, "for providing the use of laboratories and technical support in the Michael Golden laboratories." Neither access to the laboratories nor technical support was provided, or authorized by the authors.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF5 Refer to the figure described in Allegation 1.3a.

FF II.3-1. The figure in question in was originally published as FIG.1 page 2485 in [ref 1] **Travis** L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble, "Low-cost manufacturing process of nanostructured metals and alloys," Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488.

FF II.3-2. The figure in question was subsequently published as Figure 3. in M. J. Jackson, G. M. Robinson, and M. D. Whitfield, "Manufacture of nanocrystalline metals by machining processes," Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

FF II.3-3. The figure in question is not referenced in M. J. Jackson, G. M. Robinson, and M. D. Whitfield, "Manufacture of nanocrystalline metals by machining processes," Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

FF II.3-4. The figure 3 caption in Jackson, et al. refers to the material shown as copper. The text refers to material shown in figure 3 as brass.

FF II.3-5. The figure reproduced from Brown, et al. was presented in a manner and context that indicated the figure was the original work of Jackson and co-authors. *FF6-FF14 Refer to the figure described in Allegation 1.3b.*

FF II.3-6. The right image in question in was originally published as Fig. 12 page 1538 in [ref 2] Srinivasan Swaminathan, M. Ravi Shankar, Balkrishna C. Rao, W. Dale Compton, Srinivasan Chandrasekar, Alexander H. King, and Kevin P. Trumble, "Severe plastic deformation (SPD) and nanostructured materials by machining," Journal of Material Research, 4 January 2007, pp. 42:1529-1541.

FF II.3-7. The right image in question was originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.3-8. The right image in question was originally included in a presentation entitled [ref 5] "Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble, and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.3-9. The right image in question was originally included in a presentation entitled [ref 6] "Nanostructured Materials by Large Strain Machining," by Srinivasan Chandrasekar, W. Dale Compton, Alex King, Kevin Trumble, and Thomas N. Farris, ARO-Purdue, April 2006. The presentation has not been published. FF II.3-10. The left and right images in question were originally included in a presentation entitled [ref 8] "Consolidation of Nanocrystalline Material," by Balkrishma C. Rao, Purdue University, October 2005. The presentation has not been published.

FF II.3-11. The figures in question were subsequently published as Figure 4. in M. J. Jackson, G. M. Robinson, and M. D. Whitfield, "Manufacture of nanocrystalline metals by machining processes," Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

FF II.3-12. The figures in question are not referenced in M. J. Jackson, G. M. Robinson, and M. D. Whitfield, "Manufacture of nanocrystalline metals by machining processes," Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

FF II.3-13. The figure 4 caption in Jackson, et al. cites a Vickers hardness value of 535 H_V . The text cites the hardness as 585 kg/mm². These values are inconsistent since Vickers hardness can be expressed as Hv or kg/mm².

FF II.3-14. The figures reproduced from Swaminathan, et al. and from presentation by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures and data were the original work of Jackson and co-authors.

FF15-FF17 Refer to the figure described in Allegation 1.3c.

FF II.3-15. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he received permission from Professor Chandrasekar to use the laboratories under control of Professor Chandrasekar and the Industrial Engineering Department.

FF II.3-16 .Testimony from Professor, Professor,and Professoron May 8, 2015. Professorindicated that he didnot give Mark Jackson permission to use the laboratories in question.indicated that he did

FF II.3-17. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the laboratory space which as the subject of this allegation.

FF18-FF20 Refer to the overall evidence and testimony related to Allegation 1.3.

FF II.3-18. For allegations 1.3b the figures in question are not referenced or cited in M. J. Jackson, G. M. Robinson, and M. D. Whitfield, "Manufacture of nanocrystalline metals by machining processes," Journal of Achievements in Materials and Manufacturing Engineering, Volume 20, Issues 1-2, January-February 2007, pp. 27-30.

FF II.3-19. For allegations 1.3b, the figures reproduced from published work and unpublished presentations by the complainants and/or their students were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF II.3-20. For allegation 1.1c, the committee has not received conclusive evidence indicating Mark Jackson was given permission to use the laboratory space by Professor Chandrasekar.

II.4 Allegation 1.4

Allegation 1.4: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text and illustrations in book chapter 12 entitled "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

Allegation 1.4a: Fig. 12.27 shows the same Brown et al. (2002) [1] image, as in 1b, 2a and 3a, again stretched vertically, but to a lesser aspect ratio than in 3a. The copyright to this previously published image is held by Journal of Materials Research, not the authors.

Allegation 1.4b: Fig. 12.28 shows four TEM images from the authors' work, which are the same images published by Jackson in 1c.

Allegation 1.4c: Fig. 12.29 shows four TEM images taken from the authors' work showing pure aluminum chip microstructure produced at different shear strain levels. These images were presented by the authors in posters and oral presentations, but were not published by the authors. Note that the figure labels and accompanying text in the left margin are identical with those on slide 6 of the Leeds-Lyon Tribology Symposium presentation given by the authors [3].

Allegation 1.4d: Fig. 12.30 shows a column chart of Hardness in "Bulk" and "Nano" forms of thirteen different alloys. This chart was created by the authors, based on their experimental measurements. It has appeared in several of the authors' conference presentations, but had not been published by the authors.

Allegation 1.4e: Fig. 12-31 contains three images from the authors' work. One image shows an early modulation-assisted machining device developed by the authors in the authors' lab and which is currently being commercialized by . This device is similar to, but different than, the device shown in the image published by Jackson in 1e. Images of this device have been shown in posters and presentations given by the authors, but they had not been published, pending patenting and commercialization. Fig. 12.31 also shows images of continuous chips produced by "conventional turning" and particles produced by "turning with modulation" (material not identified). These images also have been presented by the authors in posters and presentations given by the authors, but have not been published by the authors. Note the layout and labeling of these pictures is identical with that on slide 9 of the Leeds-Lyon Tribology Symposium presentation given by the authors [3]. No acknowledgement or reference for the source of these three images is given in the caption.

Allegation 1.4f: Fig. 12-32 shows three image frames from a movie produced by the authors in the authors' lab showing chip formation with and without modulation. See slide 11 of the Leeds-

Lyon Tribology Symposium presentation [3]. These images have not been published by the authors.

Allegation 1.4g: Fig. 12.33 shows five micrographs of chip particles produced by the authors using modulation-assisted machining. The dimensions of the particles are also given. The images have not been published by the authors. Labeling of the images is in a format identical to that used by the authors in a presentation at the Leeds-Lyon Tribology Symposium in 2005 [3].

Allegation 1.4h: Fig. 12.34 is similar to Fig. 12.33, showing six micrographs of chip particles produced by the authors in the authors' lab, labeled with modulation-assisted machining conditions used to produce the particles. Labeling of the images is in a format identical to that used by the authors in a presentation at the Leeds-Lyon Tribology Symposium in 2005 [3].

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF10 Refer to the figure described in Allegation 1.4a.

FF II.4-1. The figure in question in was originally published as FIG.1 page 2485 in [ref 1] **Travis** L. Brown, Srinivasan Swaminathan, Srinivasan Chandrasekar, W. Dale Compton, Alexander H. King, and Kevin P Trumble, "Low-cost manufacturing process of nanostructured metals and alloys," Journal of Material Research, Vol. 17, No. 10, October 2002, pp. 2484-2488.

FF II.4-2. The figure in question were subsequently published as Figure 12.27. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-3. The figure 12.27 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-4. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-5. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-6.Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-7. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-8. Testimony from Professor, Professor, andProfessoron May 8, 2015. Professortestified he did not giveMark Jackson permission to use any of the materials previously published, presented oraccessible through laboratory records.

FF II.4-9. The figure reproduced from Brown, et al. was presented in a manner and context that indicated the figure was not the original work of Jackson.

FF II.4-10. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF11-FF24 Refer to the figure described in Allegation 1.4b.

FF II.4-11. The right image in question in was originally published as Fig. 12 page 1538 in [ref 2] Srinivasan Swaminathan, M. Ravi Shankar, Balkrishna C. Rao, W. Dale Compton, Srinivasan Chandrasekar, Alexander H. King, and Kevin P. Trumble, "Severe plastic deformation (SPD) and nanostructured materials by machining," Journal of Material Research, 4 January 2007, pp. 42:1529-1541.

FF II.4-12. The right image in question was originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.4-13. The right image in question was originally included in a presentation entitled [ref 5] "Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble, and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.4-14. The right image in question was originally included in a presentation entitled [ref 6] "Nanostructured Materials by Large Strain Machining," by Srinivasan Chandrasekar, W. Dale Compton, Alex King, Kevin Trumble, and Thomas N. Farris, ARO-Purdue, April 2006. The presentation has not been published.

FF II.4-15. The left and right images in question were originally included in a presentation entitled [ref 8] "Consolidation of Nanocrystalline Material," by Balkrishma C. Rao, Purdue University, October 2005. The presentation has not been published.

FF II.4-16. The figures in question were subsequently published as Figure 12.28. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-17. The figure 12.28 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-18. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-19. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-20. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-21. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-22. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-23. The figures reproduced from Swaminathan, et al. and from presentation by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-24. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF25-FF36 Refer to the figure described in Allegation 1.4c.

FF II.4-25. The images in question were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF2 II.4-6. The images in question were originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-27. The images in question were originally included in a presentation entitled [ref 5] **"Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble,**

and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.4-28. The figures in question were subsequently published as Figure 12.29. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-29. The figure 12.29 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-30. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-31. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-32. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-33. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-34. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-35. The figures reproduced from presentations by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-36. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF37-FF49 Refer to the figure described in Allegation 1.4d.

FF II.4-37. The images in question were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published. FF II.4-38. The images in question were originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-39. The images in question were originally included in a presentation entitled [ref 5] "Nanocrystalline Materials by Machining," by Srinivasan Chandrasekhar, Kevin Trumble, and W. Dale Compton. Oak Ridge National Laboratories, February 2006. The presentation has not been published.

FF II.4-40. The right image in question was originally included in a presentation entitled [ref 6] "Nanostructured Materials by Large Strain Machining," by Srinivasan Chandrasekar, W. Dale Compton, Alex King, Kevin Trumble, and Thomas N. Farris, ARO-Purdue, April 2006. The presentation has not been published.

FF II.4-41. The figures in question were subsequently published as Figure 12.30. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-42. The figure 12.30 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-43. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-44. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-45. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-46. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-47. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-48. The figures reproduced from presentations by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-49. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF50-FF55 Refer to the figure described in Allegation 1.4e.

FF II.4-50. The images in question were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.4-51. The images in question were originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-52. The figures in question were subsequently published as Figure 12.31. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-53. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-54. Chapter references in the Jackson book on page 685 include **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-55. The figures reproduced from presentations by Mann, et al., Chandrasekhar, et al., and Rao were presented in a manner and context that indicated the figures were the original work of Jackson and co-authors.

FF50-FF60 Refer to the figure described in Allegation 1.4f.

FF II.4-50. The images in question were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.4-51. The images in question were originally included in a presentation entitled [ref 4] **"Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C.**

Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-52. The figures in question were subsequently published as Figure 12.32. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-53. The figure 12.32 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-54. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-55. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-56. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-57. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-58. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-59. The figures reproduced from presentations by Mann, et al. and Chandrasekhar, et al. were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-60. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF61-FF71 Refer to the figure described in Allegation 1.4g.

FF II.4-61. The images in question were originally included in a presentation entitled [ref 3] "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published. FF II.4-62. The images in question were originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-63. The figures in question were subsequently published as Figure 12.33. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-64. The figure 12.33 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-65. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-66. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-67. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-68. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-69. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-70. The figures reproduced from presentations by Mann, et al. and Chandrasekhar, et al. were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-71. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF72-FF83 Refer to the figure described in Allegation 1.4h.

FF II.4-72. The images in question were originally included in a presentation entitled [ref 3] **"Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-**

Assisted Machining," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. Leeds-Lyon, 8 September 2005. The presentation has not been published.

FF II.4-73. The images in question were originally included in a presentation entitled [ref 4] "Direct Production of Nanocrystalline Particulate and Consolidation," by J. B. Mann, C. Saldana, E. Paulus, S. Chandrasekar, and W. Dale Compton. SAE Aerospace, October 2005. The presentation has not been published.

FF II.4-74. The images in question were originally included in a Master of Science Thesis entitled [ref 7] "Nanostructured Particulate by Modulation-Assisted Machining," Figure 7.20, page 73, Christopher J. Saldana, December 2006.

FF II.4-75. The figures in question were subsequently published as Figure 12.34. in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-76. The figure 12.34 in the Jackson book includes "Courtesy S. Chandrasekara" in the figure caption. Chandrasekar is misspelled as Chandrasekara.

FF II.4-77. The figure in question is not referenced in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

FF II.4-78. Chapter references in the Jackson book on page 685 includes **Brown TL**, **Swaminathan S, Chandrasekar S, Compton WD, King AH, Trumble KP, J. Mater. Res.**, **17, Number 10, October 2002.**

FF II.4-79. Rebuttal from Mark J. Jackson dated August 02, 2010. Jackson stated that he was supplied material from two presentations and other materials that were not copyrighted. Jackson stated James Mann gave him permission to use the materials.

FF II.4-80. Testimony from , May 8, 2015. testified he gave a CD to Mark Jackson for classroom use. He is uncertain of the contents of the CD.

FF II.4-81. Testimony from Professor , Professor , Professor , and Professor on May 8, 2015. Professor testified he did not give Mark Jackson permission to use any of the materials previously published, presented or accessible through laboratory records.

FF II.4-82. The figures reproduced from presentations by Mann, et al. and Chandrasekhar, et al. were presented in a manner and context that indicated the figures were not the original work of Jackson and co-authors.

FF II.4-83. The committee has not received conclusive evidence indicating Mark Jackson was given permission to use the figure in question.

FF84 Refer to the overall evidence and testimony related to Allegation 1.4.

FF II.4-85. For allegations 1.4a through 1.4h, the figures in question are not referenced or cited in "Micro-and Nanomanufacturing," section 12.3.7 entitled "Nanomanufacturing by Machining," from the text "Micro and Nanomanufacturing" published by Springer Science-Business Media LLC ©2007 authored by Mark J. Jackson, pp. 664-671.

II.5 Allegation 1.5

Allegation 1.5: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the words of the Complainants in the paper M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008. Received 20 June 2007; accepted in revised form 6 August 2007.

Allegation 1.5a: Fig. 3 shows the "quick-stop" copper optical micrograph from Brown et al. (2002) [1] with "(Brown et al., 2002)" referenced in caption. This is the same micrograph published by Jackson in 1a, 2a, 3a, and 4a.

Allegation 1.5b: Fig.4 shows the same four images of the authors' work as published by Jackson in 1.1c and 1.4b. The caption falsely attributes the images to "(Brown et al., 2002)."

Allegation 1.5c: Fig. 5 is the same bar chart from the authors' work that was published by Jackson in 1.1d. It is attributed falsely as having appeared in 'Brown et al. (2002)''.

Allegation 1.5d: Fig. 6 shows a photograph of "Specially developed oscillating tool attached to piezoelectric oscillator located within machining centre." This is the same image published by Jackson in 1.1e showing an early MAM device produced by the authors in the authors' lab and is different from that published by Jackson in 4e. Again, this is an early prototype of a patented product now licensed to . No reference for this photograph is provided anywhere in the paper.

Allegation 1.5e: Fig.7 shows continuous chips and particulate produced using modulation; these are the same images published in 1.1f and 1.4e. The caption incorrectly describes the continuous chips as produced with modulation and the discontinuous chips (particles) as produced without modulation. The caption falsely attributes the pictures to "(Brown et al., JMR, 2002)." These pictures, which are the authors' original work, have not been published by the authors.

Allegation 1.5f: Figs. 14-21 show frames from a movie produced by the authors in the authors' lab showing machining of lead with a negative rake angle tool. No reference of any sort is

provided for these images, which have not been published yet by the authors in any form (movie or still frames). The movie in which these frames appear can be provided upon request. The movie was made by doctoral student , as part of his PhD research under the direction of Prof. Chandrasekar. The third image in the series (Fig. 16) is printed backwards. Neither the Results nor Discussion of Figs. 14-21 make any mention of what material is being cut in the images. The Experimental Procedures section describes experiments on lead and tin and includes a table showing results for cutting of lead and tin using tools with various rake angles of -5 to -23 degrees. The images from the movie of the authors' work on cutting of lead clearly show a tool having a rake angle of -35 degrees, which is outside the range of tool angles described anywhere in the Jackson paper.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF5 Refer to the figure described in Allegation 1.5a.

FF II.5-1. The figure in question was originally published in Brown, et al (2002) [T. L. Brown, S. Swaminathan S. Thandrasekar, W. D. Compton, A. H. King, and K. P. Trumble, Lowcost manufacturing process for nanostructured metals and alloys, Journal of Materials Research, 17 (10], 2484-2488 {2002)].

FF II.5-2. The Journal of Materials Research is a publication of the Materials Research Society.

FF II.5-3. The figure in question was subsequently published as Fig. 3 in M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008.

FF II.5-4. The figure in question is accurately referenced in the corresponding figure caption in Jackson's Materials Science and Technology publication.

FF II.5-5. The figure reproduced from Brown, et al. was presented in a manner and context that indicated the figure was not the original work of Jackson and co-authors.

FF6-FF10 Refer to the figure described in Allegation 1.5b.

FF II.5-6. The figure in question, a set of four images, was originally presented at a conference in 2005 by the complainants. Their presentation was entitled "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," and the authors were J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W. D. Compton.

FF II.5-7. The paper was presented at the Leeds-Lyon Tribology Symposium in Lyon, France, in September 2005.

FF II.5-8. The figure in question was subsequently published as Fig. 4 in M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development

during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008.

FF II.5-9. The figure in question is referenced in Jackson's Materials Science and Technology publication as originally published in "Brown et al. (2002)" [T.L. Brown, S. Swaminathan S. Thandrasekar, W.D. Compton, A.H. King, and K.P. Trumble, Low-cost manufacturing process for nanostructured metals and alloys, Journal of Materials Research, 17 (10], 2484-2488 {2002)].

FF II.5-10. The figure in question was not published in Brown et al. (2002).

FF11-FF14 Refer to the figure described in Allegation 1.5c.

FF II.5-11. A figure nearly identical to Fig. 5 in Jackson's paper was published as Figure 7.20 in the MS thesis of Christopher J. Saldana, submitted in December of 2006 [C.J. Saldana, "Nanostructured Particulate by Modulation-Assisted Machining," M.S. Thesis, Purdue University, December 2006]. The thesis advisors for C. J. Saldana were Profs. Chandrasekar and Compton.

FF II.5-12. A figure very similar to Fig. 7.20 in the MS thesis of C. J. Saldana was published as Fig. 5 as Fig. 5 in **M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim,** "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology,* Volume 24, Number 12, 2008. The shading of the histogram bars is the only difference between Fig. 7.20 from the MS thesis of C. J. Saldana and in Fig. 5 from Jackson's paper.

FF II.5-13. The figure in question is referenced in Jackson's 2007 Materials Science and Technology publication as originally published in "Brown et al. (2002)" [T. L. Brown, S. Swaminathan S. Thandrasekar, W. D. Compton, A. H. King, and K. P. Trumble, Lowcost manufacturing process for nanostructured metals and alloys, Journal of Materials Research, 17 (10], 2484-2488 {2002)].

FF II.5-14. The figure in question was not published in Brown et al. (2002).

FF15-FF19 Refer to the figure described in Allegation 1.5d.

FF II.5-15. The photograph shown in Fig. 6 of Jackson's 2007 Materials Science and Technology publication is nearly identical to the photograph presented by the complainants as Slide 13 in a presentation given at an SAE Aerospace meeting in October 2005 (J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W. D. Compton, "Direct Production of Particulate and Consolidation," Presented at Society of Automotive Engineers (SAE) Aerospace, October 2005.) except that the label "Tool Holder with PZT Actuator" has been removed in the 2007 Jackson et al. paper.

FF II.5-16. The only difference between the two figures is that the label "Tool Holder with PZT Actuator" has been removed in Jackson's 2007 Materials Science and Technology publication.

FF II.5-17. There is no citation given for Fig. 6 of Jackson's 2007 Materials Science and Technology publication.

FF II.5-18. The Respondent supplied various material connected with a patent application dated June 19, 2003 entitled "Piezoelectric nano surface machining."

FF II.5-19. There are no images in the material supplied that look similar to the machine shown in Fig. 6 of the 2007 Jackson et al. paper.

FF20-FF24 Refer to the figure described in Allegation 1.5e.

FF II.5-20. The two photographs shown in Fig. 7 of Jackson's 2007 Materials Science and Technology publication are identical to photographs presented by the complainants in presentations at two different conferences in 2005.

FF II.5-21. The photographs were shown as Slide 9 in a presentation in Lyon, France in September of 2005 [J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W. D. Compton, "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," Presented at Leeds-Lyon Tribology Symposium, Lyon, France, September 2005.]

FF II.5-22. The photographs were shown as Slide 10 in a presentation at an SAE Aerospace conference in October of 2005 [J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W. D. Compton, "Direct Production of Particulate and Consolidation," Presented at Society of Automotive Engineers (SAE) Aerospace, October 2005]

FF II.5-23. The figure in question is referenced in Jackson's 2007 Materials Science and Technology publication as originally published in "Brown et al. (2002)" [T. L. Brown, S. Swaminathan S. Thandrasekar, W. D. Compton, A. H. King, and K. P. Trumble, Lowcost manufacturing process for nanostructured metals and alloys, Journal of Materials Research, 17 (10], 2484-2488 {2002)].

FF24. The figure in question was not published in Brown et al. (2002).

FF25-FF28 Refer to the figure described in Allegation 1.5f.

FF II.5-25. The set of eight images presented as Figs. 14-21 in Jackson's 2007 Materials Science and Technology publication appear to be identical to frames from the movie supplied by the complainants.

FF II.5-26. The description of the experiment is quite detailed in Jackson's 2007 Materials Science and Technology publication.

FF II.5-27. As the complainants assert, the rake angle shown in the figure is very different from the rake angles listed in Table 1. This discrepancy is not discussed in the paper.

FF II.5-28. No reference or citation for Figs. 14-21 in Jackson's 2007 Materials Science and Technology publication is given.

II.6 Allegation 1.6

Allegation 1.6: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the paper M.J. Jackson, J. S. Morrell and W. Ahmed, "Shear strain induced formation of nanostructured pure metals," *International Journal of Nanoparticles*, Volume 1, Number 1, pp. 271-282,2008.

Figs. 7-14 of this paper are the same set of frames from the authors' movie that were published by Jackson in Figs. 14-21 in paper 5 above. Again there is no reference to the source of these images. Again, the third image in the series (Fig. 9) is printed backwards, as in 1.5f. Again there is no mention of the material being cut in these images in the Results or Discussion sections. Furthermore, the experimental procedure is word-for-word the same experimental procedure as paper 5, except the diameter of the cutting tool changed from 950 μ m to 750 μ m and the two metals changed from tin and lead to iron and copper. The three tool rake angles used for cutting each of these metals (six tool angles total) also changed, each by one degree.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF4 refer to the figures described in Allegation 1.6.

FF II.6-1. The set of eight images presented as Figs. 7-14 in Jackson's 2008 International Journal of Nanoparticles publication appear to be identical to frames from the movie supplied by the complainants.

FF II.6-2. The paragraph in the section entitled "4. Experimental Procedure" on page 274 of Jackson's 2008 International Journal of Nanoparticles publication is the same, word-for-word, as the paragraph in the section entitled "Experimental" on page 1456 of Jackson's 2007 Materials Science and Technology publication, except that the diameter of the cutting tool is listed as 950 μ m in the 2007 paper and 750 μ m in the 2008 paper, and the materials are listed as "Commercially pure lead and tin" in the 2007 paper and as "Commercially pure iron and copper" in the 2008 paper.

FF II.6-3. As the complainants assert, the rake angle shown in the figure is very different from the rake angles listed in Table 1. This discrepancy is not discussed in the paper.

FF II.6-4. No reference or citation for Figs. 7-14 in Jackson's 2008 International Journal of Nanoparticles publication is given.

II.7 Allegation 1.7

Allegation 17: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the paper M.J. Jackson and M.D. Whitfield and W. Ahmed, "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp.326-341, 2009.

Allegation 1.7a: This article is largely a repeat of paper 6 above. Fig. 3 shows the same four TEM images from the authors' work published by Jackson in le, 4b and 5b, and falsely attributed to Brown et al. (2002) [Complainant Reference 1].

Allegation 1.7b: Figs. 9-12 are selected frames from the same movie of the authors' work published by Jackson in paper 5 and paper 6 above, again without any reference. The figure captions do not indicate what metal is being cut in the images, but the text in Section 4.2 does correctly identify the metal as lead.

Allegation 1.7c: The Experimental procedure section is word-for-word the same as the Experimental section in paper 5, except the two metals changed to titanium and tin. The corresponding results in Table 1 for tin are identical to the results for tin in Table 1 in paper 5 (three different values for each of five different parameters or measurements). The results for titanium, however, show the rake and shear plane angles changed by one degree each from the values for lead in Table 1 of paper 5, whereas each of the corresponding nine measurement values is identical to the values given for lead in Table 1 of paper 5.

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1-FF4 refer to the figure described in Allegation 1.7a.

FF II.7-1. The figure in question, a set of four images, was originally presented at a conference in 2005 by the complainants. Their presentation was entitled "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," and the authors were J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W. D. Compton.

FF II.7-2. The Mann et al. paper was presented at the Leeds-Lyon Tribology Symposium in Lyon, France, in September 2005.

FF II.7-3. The figure in question was subsequently published as Fig. 3 in M.J. Jackson and M.D. Whitfield and W. Ahmed, "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp.326-341, 2009.

FF II.7-4. The figure in question is referenced in Jackson's Materials Science and Technology publication as originally published in "Brown et al. (2002)" [T. L. Brown, S. Swaminathan S. Thandrasekar, W. D. Compton, A. H. King, and K. P. Trumble, "Low-cost manufacturing process for nanostructured metals and alloys," Journal of Materials Research, 17 (10], 2484-2488 [2002)].

FF II.7-5. The figure in question was not published in Brown et al. (2002).

FF6-FF7 refer to the figures described in Allegation 1.7b.

FF II.7-6. The set of four images presented as Figs. 9-12 in Jackson's 2009 International Journal of Nanomanufacturing publication [M.J. Jackson and M.D. Whitfield and W. Ahmed, "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp.326-341, 2009] appear to be identical to frames from the movie supplied by the complainants. FF II.7-7. No reference or citation for Figs. 9-12 in Jackson's 2009 International Journal of Nanomanufacturing publication is given.

FF8-FF13 refer to the section of the paper described in Allegation 1.7c.

FF II.7-8. The paragraph in the section entitled entitled "3. Experimental Procedure" on pages 332-333 of Jackson's 2009 International Journal of Nanomanufacturing publication is the same, word-for-word, as the paragraph in the section entitled "Experimental" on page 1456 of Jackson's 2007 Materials Science and Technology publication, except that the diameter of the cutting tool is listed as 950 μ m in the 2007 paper and 750 μ m in the 2009 paper, and the materials are listed as "Commercially pure lead and tin" in the 2007 paper and as "Commercially pure titanium and tin" in the 2009 paper.

FF II.7-9. The paragraph in the section entitled "3. Experimental Procedure" on pages 332-333 of Jackson's 2009 International Journal of Nanomanufacturing publication is the same, word-forword, as the paragraph in the section entitled "4. Experimental Procedure" on page 274 of Jackson's 2008 International Journal of Nanoparticles publication, except that the materials are listed as "Commercially pure iron and copper" in the 2008 paper and "Commercially pure titanium and tin" in the 2009 paper.

FF II.7-10. Table 1 in Jackson's 2007 Materials Science and Technology publication (page 1456) is nearly identical to Table 1 in Jackson's 2009 International Journal of Nanomanufacturing publication (page 336). The values of experimental parameters (rake angle, shear plane angle), experimental results [mean lamellar spacing (µm), observed chip curl (mm)], and calculated results [calculated chip curl (mm)] listed for **tin** are identical in the two papers.

FF II.7-11. The values of mean lamellar spacing (μ m), observed chip curl (mm), and calculated chip curl (mm) listed for **lead** in Table 1 of Jackson's 2007 Materials Science and Technology publication are identical to the values of mean lamellar spacing (μ m), observed chip curl (mm), and calculated chip curl (mm) listed for **titanium** in Table 1 of Jackson's 2009 International Journal of Nanomanufacturing publication.

FF II.7-12. The values of the experimental parameter rake angle listed for **lead** in Table 1 of Jackson's 2007 Materials Science and Technology publication are one degree less than the values listed for **titanium** in Table 1 of Jackson's 2009 International Journal of Nanomanufacturing publication.

FF II.7-13. The values of the experimental parameter shear plane angle listed for **lead** in Table 1 of Jackson's 2007 Materials Science and Technology publication are one degree less than the values listed for **titanium** in Table 1 of Jackson's 2009 International Journal of Nanomanufacturing publication.

II.8 Allegation 1.8: It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the work of the complainants in the book chapter M. J. Jackson and J. S. Morrell, Editors, Machining with Nanomaterials (2009), Springer, New York, NY. *Chapter 9: Formation of Nanostructured Metals by Machining*, M. J. Jackson, J. J. Evans, C. Xu and W. Ahlmed, pp. 297-323.

Allegation 1.8a: Fig. 9.3: same as in 1.1b, 1.2a, 1.3a, 1.4a and 1.5a.

Allegation 1.8b: Fig. 9.4: same as in 1.1c, 1.4b, 1.5b and 1.7a, falsely attributed to Brown et al. (2002) [Complainant Reference 1] and published without permission.

Allegation 1.8c: Fig. 9.5: same as 1.1d and 1.5c, falsely attributed to Brown et al. (2002) and published without permission.

Allegation 1.8d: Figure 9.6: same as 1.1e and 1.5d, with no reference given and published without permission.

Allegation 1.8e: Fig. 9.7: same as 1.1f, 1.4e and 1.5e, falsely attributed to Brown et al. (2002) and published without permission.

Allegation 1.8f: Figs. 9.14-9.21: same 8 frames of the authors' movie published in 1.5f and 1.6.

Allegation 1.8g: Section 9.2.2 starting on p. 304 opens with plagiarism by paraphrasing the beginning of Brown et al. 2002. From the second paragraph on p. 304, there is word-for-word and paraphrasing plagiarism of paragraph 6 of Brown et al. (2002).

Committee Report:

The committee makes the following findings of fact regarding this allegation.

FF1 refers to the figure described in Allegation 1.8a.

FF II.8-1: The image in Fig. 9.3 is from Brown et al. (2002) and the image is referenced in the caption.

FF2-FF3 refer to the figure described in Allegation 1.8b.

FF II.8-2: The set of four images presented in Fig. 9.4 were presented at a conference in 2005 in a presentation by the complainants (Reference 3).

FF II.8-3: The caption of Fig. 9.4 incorrectly cites Brown, et al. (2002) as the source of this

material.

FF4-FF5 refer to the figure described in Allegation 1.8c.

FF II.8-4: The bar chart in Fig. 9.5 is nearly identical to the bar chart shown in Fig. 7.20 of the MS thesis of submitted in December of 2006. The thesis advisors for were Profs. Chandrasekar and Compton.

FF II.8-5: The caption of Fig. 9.5 incorrectly cites Brown, et al. (2002) as the source of this material.

FF6-FF7 refer to the figure described in Allegation 1.8d.

FF II.8-6: The photograph shown in Fig. 9.6 is identical to the photograph presented by the complainants is a presentation given at an SAE Aerospace meeting in October 2005 (Complainant Reference 4, Slide 13) except that the label "Tool Holder with PZT Actuator" has been removed in the 2007 Jackson et al. paper. The Respondent supplied various material connected with a patent application dated June 19, 2003 entitled "Piezoelectric nano surface machining." There are no images in the material supplied that look similar to the machine shown in Fig. 9.6 in Jackson's 2009 book chapter.

FF II.8-7: Fig. 9.6 is presented in a manner that would indicate that the photograph is the original work of Jackson and co-authors, without citation or acknowledgement.

FF8-9 refer to the figure described in Allegation 1.8e.

FF II.8-8: The set of two images presented in Fig. 9.7 were presented at two conferences in 2005 in two different presentations by the complainants (Complainant Reference 3, Slide 9; Complainant Reference 4, Slide 10).

FF II.8-9: The caption of Fig. 9.7 incorrectly cites Brown, et al (2002) as the source of this material.

FF10-FF13 refer to the figure described in Allegation 1.8f.

FF II.8-10: The set of eight images presented as Fig. 9.7 appear to be identical to frames from the movie supplied by the complainants.

FF II.8-11: The paragraph in the section entitled "9.3. Experimental Procedure" is the same, word-for-word, as the paragraph in the section entitled "Experimental" on page 1456 of Jackson's 2007 Materials Science and Technology publication, except that the diameter of the cutting tool is listed as 950 μ m in the 2007 paper and 750 μ m in the 2008 paper, and the materials are listed as "Commercially pure lead and tin" in the 2007 paper and as "Commercially pure iron and copper" in the 2008 paper.

FF II.8-12: As the complainants assert, the rake angle shown in the figure is very different from

the rake angles listed in Table 1. This discrepancy is not discussed in the paper.

FF II.8-13: No reference or citation is given for Fig. 9.7.

FF14 refers to the figure described in Allegation 1.8g.

FF II.8-14: There is significant similarity between the second paragraph of Section 9.2.2 and the fifth paragraph in Brown et al. (2002) (Complainant Reference 1).

FF15-FF16 refer to the stated experimental procedure and data in Table I.

FF II.8-15: The paragraph in the section entitled entitled "9.3. Experimental Procedure" on pages 309-201 is the same, word-for-word, as the paragraph in the section entitled "Experimental" on page 1456 of Jackson's 2007 Materials Science and Technology publication.

FF II.8-16: The values in Table 1 (page 315) are identical to those in Table 1 in Jackson's 2007 Materials Science and Technology publication, and the same materials are presented.

III. Findings of Fact Related to Allegations 2.1 and 2.2

Allegation 2.1

It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text of a paper by Milton C. Shaw entitled "The size effect in metal cutting" published in Sadhana, Vol. 28, Part 5, October 2003, pp. 875-896, by reproducing this text verbatim or nearly verbatim in a chapter entitled "The Size Effect in Micromachining," Milton C. Shaw and Mark J. Jackson, Chapter 4 in <u>Microfabrication and Nanomanufacturing</u>, Mark J. Jackson, editor, CRC Press (Taylor and Francis), Boca Raton, FL, 2006, pp. 87-109.

Allegation 2.2

It is alleged that Prof. Mark Jackson committed Research Misconduct by intentionally, knowingly, or recklessly plagiarizing the text of a paper by Milton C. Shaw entitled "The size effect in metal cutting" published in Sadhana, Vol. 28, Part 5, October 2003, pp. 875-896, by reproducing this text verbatim or nearly verbatim in a chapter entitled "Meso-Micromachining," Chapter 4 in <u>Micro and Nanomanufacturing</u>, Mark J. Jackson, Springer Science + Business Media, LLC, New York, NY, 2007, pp. 143-190.

Committee Report:

The Committee makes the following findings of fact regarding Allegations 2.1 and 2.2.

FF III-1: The material in question was originally published in: Milton C. Shaw, "The Size Effect in Metal Cutting," Sadhana, Vo. 28, Part 5, October, 2003, pp. 875-896.

FF III-2. Sadhana is a bi-monthly research journal published by Indian Academy of Sciences.

FF III-3: Documents supplied by the respondent include:

i) an exchange of correspondence between Jackson and Shaw: May 29, 2002 letter from Jackson (while at Tennessee Tech) to Shaw suggesting preparation of a joint paper for Proceedings of the Indian Academy of Science, stating that Jackson was currently preparing a review article and listing potential topics for the article,

ii) Sept. 1, 2002 letter from Shaw to Jackson, which acknowledged receipt of the May 29 letter and stated that a manuscript was enclosed for Jackson's consideration. Shaw requests Jackson's full affiliation "so that it can be included in the journal." Shaw notes that he has added a section on inhomogeneous strain and problems associated with using the von Mises criterion (both topics mentioned in Jackson's May 29 letter). Shaw closes the letter by stating that, after receiving Jackson's affiliation details and comments on the manuscript, he (Shaw) will send the manuscript to V. C. Venkatesh (identified as point of contact in Jackson's May 29 letter).
iii) A copy of the manuscript, containing the same figures, equations and references as the final Sadhana journal paper. The manuscript lists Shaw (with his full affiliation) and the name of M. J. Jackson (without affiliation); Jackson's affiliation (Tennessee Tech) is hand-written on the manuscript.

FF III-4. In email correspondence with Indian Academy of Sciences (Sept. 18-19, 2005), Grant Robinson (acting on behalf of Jackson) indicated that the 2003 Sadhana article was a joint publication by M. C. Shaw and M. J. Jackson. The response from G. Madhavan at IAS indicated that the article had been a single-author article by Milton C. Shaw.

FF III-5. Jackson's July 31, 2010 response to Dunn's letter indicated that he "wrote to Prof. Shaw with a suggested plan of the joint paper and Prof. Shaw communicated back to me agreeing to its format and structure." He states "the paper was submitted and published without my name on it as co-author, which was not the initial agreement between Prof. Shaw and myself."

FF III-6. No evidence has been provided to the committee indicating that Jackson made direct contribution to the Sadhana paper beyond suggesting topics (in the May 29, 2002 letter from Jackson to Shaw).

FF7-FF12 refer to "The Size Effect in Micromaching," Milton C. Shaw and Mark J. Jackson (Purdue), Chapter 4 in "Microfabrication and Nanomanufacturing," Mark J. Jackson (Purdue University), editor, CRC Press (Taylor and Francis), 2006.

FF III-7. pp. 87-109 of this book chapter present the same text and figures contained in pp. 875-895 of Shaw's Sadhana article, with the following exceptions:

a) The chapter title and section titles have been changed.

b) The figure and equation numbering have been changed to be consistent with convention in the book.

c) The reference format has been changed and reference list has been reordered (but same references are cited).

FF III-8. As evidenced by an email correspondence between Grant Robinson (on behalf of Mark Jackson) and G. Madhavan (September 18-19, 2005), permission was obtained from Indian Academy of Sciences (IAS) to reprint figures from Shaw's 2003 Sadhana paper. However, permission was not requested/granted for reprinting entire paper. IAS stipulated "Please ensure

that while doing so, full acknowledgement is given to our journal." The Sadhana paper is not mentioned in the chapter, nor is acknowledgement made of IAS.

FF III-9. The figures used in Shaw's original paper were largely reprinted from other publications. The article in which each figure was originally published is acknowledged in the corresponding caption.

FF III-10. No evidence has been provided to the committee indicating that Professor Shaw i) gave permission to reprint the Sadhana manuscript as a chapter in the CRC Press book or ii) agreed to list Jackson as co-author on the book chapter.

FF III-11. The CRC book chapter does not reference the Sadhana paper nor the Springer book chapter, nor does it indicate that the work had been published previously.

FF III-12. Professor Shaw passed away on September 7, 2006.

FF13-20 refer to "Meso-Manufacturing," Chapter 4 in "Micro and Nanomanufacturing," Mark J. Jackson (Purdue University), Springer, 2007.

FF III-13. pp. 143-181 of this book chapter present the same text and figures contained in pp. 875-895 of Shaw's Sadhana article, with the following exceptions:

a) The chapter title and section titles have been changed.

b) The figure and equation numbering have been changed to be consistent with convention in the book.

c) The reference format has been changed and reference list has been reordered (but same references are cited).

d) A section 4.6 (Meso-Micromachining Processes) and section 4.7 (problems) has been added, along with associated references 40-42.

FF III-14. The figures used in Shaw's original paper were largely reprinted from other publications. The article in which each figure was originally published is acknowledged in the corresponding caption.

FF III-15. The preface of the book includes the statement "The structure of the book is based on matter provided by many colleagues and the author wishes to thank ... Emeritus Professor Milton Shaw, Arizona State University ... for helping construct a source of knowledge and information on micro- and nanomanufacturing and for granting the author permission to use such matter." (names of several other people were also listed, but have been omitted from this report for brevity). Other than this acknowledgement, neither the introduction nor the chapter in question indicate that the work was previously published by Shaw.

FF III-16. The Springer book chapter does not reference the Sadhana paper nor the CRC Press book chapter, nor does it indicate that the work had been published previously.

FF III-17. The documents submitted by the respondent include a copy of a request letter allegedly sent to Prof. Shaw (and comparable letters to authors of other chapters). The letter is dated April 2, 2005, and includes a provision of "If I do not hear from (sic) by the 2nd of June, I

will assume that permission is granted from you and that we will notify you of the granting of permissions from the original sources." The respondent's documents include copies of the letters allegedly sent to original authors of the respective chapters, but does not include response letters.

FF III-18. No evidence has been provided to the committee indicating that Professor Shaw i) gave permission to reprint the Sadhana manuscript as a chapter in the Springer book or ii) agreed to have the work appear without specific acknowledgement of his original authorship in a book authored by Shaw.

FF III-19. As evidenced by an email correspondence between Grant Robinson (on behalf of Mark Jackson) and G. Madhavan (September 18-19, 2005), permission was obtained from Indian Academy of Sciences (IAS) to reprint figures from Shaw's 2003 Sadhana paper. However, permission was not requested/granted for reprinting entire paper. IAS stipulated "Please ensure that while doing so, full acknowledgement is given to our journal." The Sadhana paper is not mentioned in the chapter, nor is acknowledgement made of IAS.

FF III-20. The documents submitted by Jackson regarding correspondence with Sadhana (and other publishers) indicate that permission was requested on the same date for use in both the CRC Press book chapter and for the Springer book chapter. This indicates that certain aspects of the chapter preparation were occurring concurrently for the two books.

VII. Conclusions

Based on the preponderance of evidence available to the committee including (i) copies of the articles/chapters in question, (ii) documents provided by the Respondent, Complainants, and other witnesses, and (iii) interviews, it is the Investigation Committee's unanimous determination that the Respondent has intentionally, knowingly, and/or recklessly committed Plagiarism, Fabrication, and Falsification as defined in Purdue Policy III.A.1; that these actions represent significant departures from standard practices for a major research institution such as Purdue University; and that the Respondent's actions did not arise out of honest errors or differences of opinion. As a result, the Investigation Committee concludes unanimously that the Respondent has committed Research Misconduct.

Specifically, the Committee finds that the preponderance of the evidence supports findings of Plagiarism for allegations 1.1a-f, 1.2b, 1.3a-b, 1.4e, 1.5b, 1.5d, 1.5e, 1.6, 1.7b, 1.8d, 1.8f, 1.8g, 2.1, and 2.2; findings of Falsification for allegations 1.1c, 1.1f, 1.3b, 1.5b, 1.5e, 1.6, 1.7b, and 1.8e-f; and findings of Fabrication for allegations 1.5e, 1.6, 1.7b, and 1.8f.

Following are the Committee's comments regarding each of the allegations under consideration.

VII.1 Allegations 1.1-1.4

VII.1.a Summary of Findings of Fact Regarding Allegations 1.1-1.4

These publications contain several figures that were originally generated and published or presented by Professor Chandrasekar, his students and co-authors. These figures include:

- 1. An optical micrograph of a pure copper chip, which originally appeared in Brown, et al. (2002).
- 2. A collection of four transmission electron microscope ITEM) images. Three of the four micrographs were published in Swaminathan et al (2007), and the four micrographs were presented together by Chandrasekar and co-authors in conference presentations.
- 3. A bar chart originally presented by Conference in October 2005 and included in MMS thesis in 2006.
- 4. A micrograph of an early Modulation-Assisted Machining (MAM) device, which was originally published in the SAE Aerospace Conference in October 2005 (Mann, et al.).
- 5. Two images of machining chips which were originally presented by Mann, et al. at a conference in Leeds-Lyon in September 2005.

VII.1.a.i. The figures in question were used in the publications in question in Allegations 1.1-1.4. With a few exceptions (as noted in specific findings of fact), the figures were presented either without specific citation or with incorrect citation.

VII.1.a.ii. In some cases (as noted in specific findings of fact), the figures were presented in a manner that implied that the figures were the original work of Jackson and co-authors.

VII.1.a.iii. For several of the figures in question, Jackson stated that the images/figures were provided to him in electronic form by James Mann.

VII.1.a.iv. Several witnesses, including co-authors on the publications listed in items 1-5 (above), have testified that neither Jackson nor his co-authors discussed the interpretation of the figures in question with them.

VII.1.b. Conclusions Related to Allegation 1.1

VII.1.b.i. Allegation 1.1a: The committee finds that the text is a paraphrase of material in Brown, et al., presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.b.ii. Allegation 1.1b: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.b.iii. Allegation 1.1c: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of wording in the caption that is ambiguous regarding ordering of the images and a statement about grain size that is not applicable for one of the images. It does not appear that Jackson or co-authors discussed the meaning/interpretation of the figure with the individuals that originally created/published the material. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification.

VII.1.b.iv. Allegation 1.1d: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.b.v. Allegation 1.1e: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.b.vi Allegation 1.1f: The committee finds that the image in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, i.e. the caption indicates an ordering of first and second images that is opposite to the actual images. It does not appear that Jackson or co-authors discussed the meaning/interpretation of the figure with the individuals that originally created/published the material. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification.

VII.1.b.vii. Allegation 1.1g: The statements in the acknowledgement are not accurate, since the persons cited did not grant the permissions indicated. However, the committee finds that there is not sufficient evidence to determine intent, nor to reach a specific conclusion regarding plagiarism.

VII.1.c. Conclusions Related to Allegation 1.2

VII.1.c.i. Allegation 1.2a: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.1.c.ii. Allegation 1.2b: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.d. Conclusions Related to Allegation 1.3

VII.1.d.i. Allegation 1.3a: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.d.ii. Allegation 1.3b: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of values stated for hardness in the figure caption and corresponding section of text, which are comparable to values obtained for Inconel by Chandrasekar et al., rather than the values for the material depicted in the images. It does not appear that Jackson or co-authors discussed the meaning/interpretation of the figure with the individuals that originally created/published the material. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification.

VII.1.d.iii. Allegation 1.3c: The statements in the acknowledgement are not accurate, since the persons cited did not grant the permissions indicated. However, the committee finds that there is not sufficient evidence to determine intent, nor to reach a specific conclusion regarding plagiarism.

VII.1.e. Conclusions Related to Allegation 1.4

VII.1.e.i. Allegation 1.4a-1.4d: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.1.e.ii. Allegation 1.4e: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.1.e.iii. Allegation 1.4f-1.4h: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.2 Allegations 1.5 and 1.8

VII.2.a. Summary of Findings of Fact Regarding Allegations 1.5 and 1.8

These publications contain several figures that were originally generated and published or presented by Professor Chandrasekar, his students and co-authors. These figures include:

- 1. An optical micrograph of a pure copper chip, which originally appeared in Brown, et al. (2002).
- 2. A collection of four transmission electron microscope (ITEM) images. Three of the four micrographs were published in Swaminathan et al. (2007), and the four micrographs were presented together by Chandrasekar and co-authors in conference presentations.
- 3. A bar chart originally presented by Conference in October 2005 and included in MMS thesis in 2006.
- 4. A micrograph of an early Modulation-Assisted Machining (MAM) device, which was originally published in the SAE Aerospace Conference in October 2005 (Mann, et al.).
- 5. Two images of machining chips which were originally presented by Mann, et al. at a conference in Leeds-Lyon in September 2005.
- 6. Frames from a movie generated by as part of his PhD research under the direction of Prof. Chandrasekar.

1.5-1.8a. Several of these figures (items 1-5 above) were used in the publications in question in Allegations 1.5 and 1.8. As noted in the specific findings of fact, several of the figures were presented with incorrect citations or with no citation.

1.5-1.8b. The figure listed in item 4 (above) was presented in a manner that implied that the figure was the original work of Jackson and co-authors.

1.5-1.8c. The images in question (item 6 above) were used in the publications in question in Allegations 1.5 and 1.8. The images were presented in a manner that implied that the images were the original work of Jackson and co-authors. No citation was provided for the figure.

1.5-1.8d. For several of the figures in question, Jackson stated that the images/figures were provided to him in electronic form by

1.5-1.8e. Several witnesses, including listed in items 1-5 (above), have testified that neither Jackson nor his co-authors discussed the interpretation of the figures in question with them.

1.5-1.8f. Based on the preponderance of evidence, it is more likely than not that the values presented in Table I in 1.5 and Table I in 1.8 were not obtained experimentally by Jackson and co-authors. The supporting findings of fact include:

i) The images in question (item 6 above) were obtained for lead, while the papers describe lead and tin.

ii) The rake angle in the images in question is outside of the range of angles described in the corresponding papers.

iii) The values presented in "Table I" in the publications in question in Allegations 1.5-1.8 include a) rake angles that each changed by one degree from material-to-material (e.g. values presented in publications considered in 1.6 vs 1.5) and b) comparable values of extracted parameters for dissimilar materials (e.g. lead vs titanium).

iv) Statements provided by Jackson and by the Complainants indicate that Jackson and his co-authors were not authorized to access laboratories in Michael Golden Laboratories.

v) No evidence has been provided to the committee indicating that Jackson or his coauthors obtained the data used to generate the parameters in the respective "Table I" of these publications.

VII.2.b Conclusions related to Allegation 1.5

VII.2.b.i. Allegation 1.5a: The committee finds that the figure in question was not the original work of Jackson, et al. In this instance, the figure is presented with correct attribution. There is not sufficient evidence to support the allegation of plagiarism.

VII.2.b.ii. Allegation 1.5b: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of wording in the caption that is ambiguous regarding ordering of the images and a statement about grain size that is not applicable for one of the images. It does not appear that Jackson or co-authors discussed the meaning/interpretation of the figure with the individuals that originally created/published the material. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification.
VII.2.b.iii. Allegation 1.5c: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.2.b.iv. Allegation 1.5d: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.2.b. v. Allegation 1.5e: In evaluating this allegation, the committee considered the images shown in the figure and the corresponding data presented in Table 1, along with comparable images and data in other publications in question. The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of inconsistent time values stated for identical images in other publications. It does not appear that Jackson or co-authors discussed the meaning/interpretation of the figure with the individuals that originally created/published the material. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

Regarding the data presented in Table 1, the available evidence regarding limited access to laboratories, lack of evidence indicating that Jackson and co-authors generated the data, and comparable values reported for various materials in the papers in questions raise serious questions about whether the values reported in the table actually correspond to experimental results. The committee concludes that a preponderance of the evidence indicates that Respondent engaged in "making up data or results and recording or reporting them", therefore constituting "fabrication" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification of the images shown in the figure and fabrication of the data presented in the table.

VII.2.c Conclusions related to Allegation 1.8

VII.2.c.i. Allegation 1.8a: The committee finds that the figure in question was not the original work of Jackson, et al. In this instance, the figure is presented with correct attribution. There is not sufficient evidence to support the allegation of plagiarism.

VII.2.c.ii. Allegation 1.8b and 1.8c: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.2.c.iii. Allegation 1.8d: The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.2.c.iv. Allegation 1.8e: The committee finds that the image in question was not the original work of Jackson, et al., and was presented with incorrect attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, i.e. the caption indicates an ordering of first and second images that is opposite to the actual images. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of falsification.

VII.2.c.v. Allegation 1.8f: In evaluating this allegation, the committee considered the images shown in the figure and the corresponding data presented in Table 1, along with comparable images and data in other publications in question. The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of inconsistent time values stated for identical images in other publications. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

Regarding the data presented in Table 1, the available evidence regarding limited access to laboratories, lack of evidence indicating that Jackson and co-authors generated the data, and comparable values reported for various materials in the papers in questions raise serious questions about whether the values reported in the table actually correspond to experimental results. The committee concludes that a preponderance of the evidence indicates that Respondent engaged in "making up data or results and recording or reporting them", therefore constituting "fabrication" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification of the images shown in the figure and fabrication of the data presented in the table.

VII.2.c.vi. Allegation 1.8g: The committee finds that the text is a paraphrase of material in Brown, et al., presented without attribution. The preponderance of evidence supports the allegation of plagiarism.

VII.3. Allegations 1.6-1.7

VII.3.a. Summary of Findings of Fact Regarding Allegations 1.5 and 1.8

These publications contain several images that were originally generated and published or presented by Professor Chandrasekar, his students and co-authors. These images include frames from a movie generated by as part of his PhD research under the direction of Prof. Chandrasekar.

1.6-1.7a. The images described in item 1 (above) were used in the publications in question in Allegations 1.6-1.7. No citation was provided for the figure. The images were presented in a manner that implied that the images were the original work of Jackson and co-authors.

1.6-1.7b. For the figures in question, Jackson stated that the images/figures were provided to him in electronic form by

1.6-1.7c. Several witnesses, including

, have testified that neither Jackson nor his co-authors discussed the interpretation of the figures in question with them.

1.6-1.7d. Based on the preponderance of evidence, it is more likely than not that the values presented in Table I in 1.6 and Table I in 1.7 were not obtained experimentally by Jackson and co-authors. The supporting findings of fact include:

i) The images in question (item 1 above) were obtained for lead, while the papers describe iron and copper (1.6) or titanium and tin (1.7).

ii) The rake angle in the images in question is outside of the range of angles described in the corresponding papers.

iii) The values presented in "Table I" in the publications in question in Allegations 1.5-1.8 include a) rake angles that each changed by one degree from material-to-material (e.g. values presented in publications considered in 1.6 vs 1.5) and b) comparable values of extracted parameters for dissimilar materials (e.g. lead vs titanium).

iv) Statements provided by Jackson and by the Complainants indicate that Jackson and his co-authors were not authorized to access laboratories in Michael Golden Laboratories.

v) No evidence has been provided to the committee indicating that Jackson or his coauthors obtained the data used to generate the parameters in the respective "Table I" of these publications.

VII.3.b Conclusions related to Allegation 1.6

VII.3.b.i. Allegation 1.6: In evaluating this allegation, the committee considered the images shown in the figure and the corresponding data presented in Table 1, along with comparable images and data in other publications in question. The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of inconsistent time values stated for identical images in other publications. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not

accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

Regarding the data presented in Table 1, the available evidence regarding limited access to laboratories, lack of evidence indicating that Jackson and co-authors generated the data, and comparable values reported for various materials in the papers in questions raise serious questions about whether the values reported in the table actually correspond to experimental results. The committee concludes that a preponderance of the evidence indicates that Respondent engaged in "making up data or results and recording or reporting them", therefore constituting "fabrication" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification of the images shown in the figure and fabrication of the data presented in the table.

VII.3.c Conclusions related to Allegation 1.7

VII.3.c.i. Allegation 1.7a: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.3.c.ii. Allegation 1.7b: In evaluating this allegation, the committee considered the images shown in the figure and the corresponding data presented in Table 1, along with comparable images and data in other publications in question. The committee finds that the figure in question was not the original work of Jackson, et al., and was presented without attribution.

In addition, the figure is presented in a manner that misrepresents the technical content of the images, in terms of inconsistent time values stated for identical images in other publications. The committee views Respondent's knowing and reckless misreporting of figures and results obtained from others as "changing or omitting data or results so that the research involved is not accurately represented in the research record", therefore constituting "falsification" as defined in Policy III.A.2.

Regarding the data presented in Table 1, the available evidence regarding limited access to laboratories, lack of evidence indicating that Jackson and co-authors generated the data, and comparable values reported for various materials in the papers in questions raise serious questions about whether the values reported in the table actually correspond to experimental results. The committee concludes that a preponderance of the evidence indicates that Respondent engaged in "making up data or results and recording or reporting them", therefore constituting "fabrication" as defined in Policy III.A.2.

The preponderance of evidence supports the allegation of plagiarism and falsification of the images shown in the figure and fabrication of the data presented in the table.

VII.3.c.iii. Allegation 1.7c: The committee finds that the figure in question was not the original work of Jackson, et al. While the incorrect spelling and lack of citation fall well below usual standards for referencing prior work by other researchers, the attribution would at least allow

readers to understand that the work was not original work by the authors. There is not sufficient evidence to support the allegation of plagiarism.

VII.4 Allegations 2.1-2.2

VII.4.a. Summary of Findings of Fact Regarding Allegation 2.1

This book chapter is a verbatim or near-verbatim reproduction of the entire Sadhana journal article originally published by Milton C. Shaw. Jackson was added as co-author without explicit permission from Prof. Shaw. The chapter was represented as original work, with neither reference of prior appearance in Sadhana nor acknowledgement of Indian Academy of Sciences for re-use of material.

VII.4.b. Conclusions related to Allegation 2.1

For Allegation 2.1, the preponderance of evidence supports the allegation of plagiarism.

VII.4.c. Summary of Findings of Fact Regarding Allegation 2.2

This book chapter contains a verbatim or near-verbatim reproduction of the entire Sadhana journal article originally published by Milton C. Shaw; in this case, a new section was added. The chapter was represented as original work, with neither reference of prior appearance in Sadhana nor acknowledgement of Indian Academy of Sciences for re-use of material. Jackson is listed as the sole author of the book. The book does not explicitly indicate the original author of the work (Shaw).

VII.4.d. Conclusions related to Allegation 2.2

For Allegation 2.2, the preponderance of evidence supports the allegation of plagiarism.

VIII. Concluding Observations

For each publication in question, the preponderance of evidence supports a finding of plagiarism for one or more of the allegations. For some allegations, the preponderance of evidence supports findings of falsification or fabrication.

Within the publications in question, there were a number of examples of figures that were not the original work of Jackson and co-authors, but which were presented with some attribution, albeit incomplete or incorrect attribution. In the corresponding allegations, the committee concluded that the use of the figure did not meet the formal definition of plagiarism, since a reader would reasonably conclude that the figure in question was not the original work of Jackson and co-authors.

The overall pattern of use of figures in the publications under consideration, along with issues regarding permissions to use material and to access laboratories, raised a number of areas of concern regarding the originality and scientific rigor of the publications in question. While not necessarily applicable to findings of plagiarism, falsification or fabrication, these issues establish a pattern of behavior by Jackson. These areas of concern include:

- i) Attempts to attribute/cite prior work were somewhat haphazard, ranging from no attribution to "courtesy of…" to incorrect citations. These somewhat sloppy attempts at attribution are inconsistent with best practices for publication, in which authors are expected to faithfully represent the original source of figures and data.
- ii) The use of identical figures in multiple publications is not typical practice, regardless of the original source of the figures, and raises questions about the originality of the various publications.
- iii) In a number of cases, Jackson and co-authors used copyrighted material without the permission of copyright holder.
- iv) In a number of cases, Jackson and co-authors used figures and/or data without the consent of the individuals involved in the original acquisition of the images/data.
- v) In a number of cases, Jackson and co-authors used images/figures that had not been published in the open literature. Associated concerns include:
 - a. Such use could have prevented the original creators of the images/figures from publishing the material as their original work.
 - b. In some cases, the original creators of the images/figures were withholding publication in order to maintain intellectual property and/or commercialization rights.
 - c. Figures and data that have not been published in the open literature may represent preliminary results and are typically not reviewed/analyzed as critically by the original creators (in comparison to material in a manuscript for a peer reviewed journal). Publication by another group without detailed discussions with the original creators is likely to result in incomplete or incorrect representation/interpretation of the figures/data.
- vii) It does not appear that Jackson's group was ever authorized to access the laboratories in Michael Golden Laboratories. If Jackson's group did access the laboratories in

order to acquire data for the publications in question, it would have been without permission of the individual in charge of those laboratories.

Memorandum

To:	Peter E. Dunn, Associate Vice President for Research
	Research Integrity Officer

From:

Date: June 29, 2011

Re: Final Report of the Inquiry Committee in the Matter of Mark J. Jackson

This memo communicates the final report of the Committee appointed under Purdue's Policy on Research Misconduct (Policy VIII.3.1) to conduct an inquiry into allegations of potential research misconduct by Prof. Mark J. Jackson, Department of Mechanical Engineering Technology, College of Technology, who will be referred to as the Respondent. The allegations originated in a letter to the Research Integrity Officer dated 23 April 2010 from Professors and of the School of Industrial Engineering and Professor of the School of Materials Engineering, who will be referred to as Complainants. Specifically, it was alleged that Prof. Jackson published research results of the above named Complainants and their collaborators (Allegation 1). This included allegedly publishing original figures and research results without permission, and, in many instances, without appropriate attribution. Alleged appropriation of results, word-for-word copying, inappropriate paraphrasing, and/or style plagiarism of previously published work are also alleged to have occurred. In addition, it was alleged that fabrication/falsification has occurred in the form of misrepresentation of data, including figures, text and results. Eight (8) publications authored or co-authored by the Respondent have been identified in support of these allegations. Materials provided by the Complainants documenting this alleged research misconduct consisted of a detailed summary of the alleged misrepresentation of research results in these eight (8) publications, and copies of the Complainant's publications and presentations which are alleged to have been the original source materials. Evidence of additional plagiarism by the Respondent (Allegation 2) was presented to the Research Integrity Officer by Prof. in a meeting on 18 November 2010. Copies of the alleged source document, an article by Milton C. Shaw published in 2003, and book chapters authored by the Respondent and published in 2006 and 2007 containing identical or nearly identical text from Dr. Shaw's article without attribution were provided as documentation of this additional alleged plagiarism.

The charge to the Inquiry Committee was defined in a memo dated 14 April 2011 from the Research Integrity Officer to the Inquiry Committee. Specifically, the Inquiry Committee was instructed to use Purdue Policy VIII.3.1 as a guide in "(i) conducting an inquiry into the allegation of research misconduct referenced above and described in the supporting materials, (ii) voting to decide if the Investigation Criteria have been satisfied with respect to the allegation and if, therefore, an investigation into this allegation of potential research misconduct with regard to the respondent is warranted, (iii) preparing a written report of the results of its inquiry with respect to the respondent, and (iv) providing this report to the University's Research Integrity Officer. The Committee is not charged with finally deciding if the respondent in fact committed research misconduct." For the purposes of this Inquiry, the Committee was instructed to utilize the definition of "Research Misconduct" in Policy VIII.3.1 which defines this term as "Conduct by a Purdue Associate taking place at Purdue or in connection with Purdue research that constitutes Fabrication, Falsification, or Plagiarism in proposing, performing, or reviewing research, or in reporting research results. Honest errors or differences of opinion do not constitute Research Misconduct."

The members of the Inquiry Committee were provided with and reviewed copies of: (i) Purdue Policy VIII.3.1, (ii) the 23 April 2010 letter from the Complainants presenting Allegation 1 and all supporting documents provided by the Complainants in support of Allegation 1, (iii) copies of the alleged source document and the Respondent's book chapters containing allegedly plagiarized text in support of Allegation 2, (iv) a letter dated 31 July 2010 from the Respondent to the Research Integrity Officer responding to Allegation 1, (v) an updated letter dated 27 March 2011 from the Respondent to the Research Integrity Officer responding to Allegation 2, and (vi) copies of documents provided by the Respondent to the Research Integrity Officer supporting the Respondent's rebuttal to Allegations 1 and 2.

The Committee met twice with the Research Integrity Officer and University counsel, Mr. William Kealey, on April 14, 2011 and April 22, 2011, and considered carefully the alleged instances of Research Misconduct identified by the Complainants as Allegations 1.1-1.8 and Allegations 2.1-2.2.

For allegations 1.1a-g, 1.2a-b, 1.3a-c, 1.4a-h, 1.5a-f, 1.6, 1.7a-c, 1.8a-g, 2.1, and 2.2, we have determined that an investigation into the allegations of potential Research Misconduct is warranted because the Investigation Criteria have been satisfied. For each of those allegations, there is a reasonable basis for concluding that the allegation falls within the definition of "Research Misconduct" in Policy VIII.3.1. For each of those allegations, the allegation may have substance, based on the Inquiry Committee's review of the evidence and records that it considered.

For allegations 1.4i and 1.5g, we have determined that an investigation is not warranted because the Investigation Criteria under Policy VIII.3.1 have not been satisfied.

These are the unanimous conclusions of this Inquiry Committee.

A draft of the Committee's final report was provided to the Respondent for review and comment on June 3, 2011. The Respondent submitted comments on the draft final report in an email to the Research Integrity Officer dated June 13, 2011. The Respondent's comments on the draft were provided to the Inquiry Committee for their consideration and are appended to the Committee's Final Report as Appendix 1. The Committee met on June 23, 2011 and revised the draft final report after considering the Respondent's comments. The revised version of the report was adopted unanimously as the Inquiry Committee's Final Report on June 29, 2011.

The Committee's comments regarding each of the alleged instances of Research Misconduct follow.

Allegation 1.1. Alleged Research Misconduct in M.J. Jackson, M.D. Whitfield, G.M. Robinson and W. Ahmed, "Surface Coatings Deposited Using Recycled Machining Chips and Turnings," in: <u>Surface Engineering</u>, *Proceedings of the 5th International Surface Engineering Congress*, May 15-17, 2006, Seattle, WA, Edited by M.J. Jackson, ASM International, pp. 155-160 (2006).

Evidence supporting Allegations 1.1a-f was presented. There are indeed substantial similarities and overlap between this paper by the Respondent [referenced above] and the Brown et al. paper [T.L. Brown, S. Swaminathan, S. Chandrasekar, W.D. Compton, A.H. King, and K.P. Trumble, Low-cost manufacturing process for nanostructured metals and alloys, *Journal of Materials Research*, 17 [10], 2484-2488 (2002)] identified by the Complainants and mentioned in 1.1a to 1.1d, and the viewgraphs mentioned in 1.1e and 1.1f. The figures mentioned in these allegations are identical, and are indeed used without attribution. The paper by the Respondent was published in 2006, well after the 2002 publication of the Brown et al. paper. The fact that the latter was published a couple of years before the Respondent was hired by Purdue seems to be at odds with the Respondent's claim that he contributed to the ideas in it. As to the Respondent's rebuttal statement that permission to use was granted, even if accurate, permission to use is not permission to appropriate, and the verbatim reproduction of material would still have required proper attribution.

If found to be true, Allegations 1.1a-f would represent plagiarism and falsification as defined in Policy VIII.3.1.

Evidence supporting Allegation 1.1 g was presented. Allegation 1.1g concerns a statement made in the Acknowledgement section of the Respondent's paper referenced above. The Complainants allege that the statement is false.

If found to be true, allegation 1.1g would represent fabrication as defined in Policy VIII.3.1.

Allegation 1.2. Alleged Research Misconduct in M.J. Jackson, G.M. Robinson, M.D. Whitfield, R.G. Handy, W. Ahmed and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," in: <u>Surface</u> <u>Engineering</u>, *Proceedings of the 5th International Surface Engineering Congress*, May 15-17, 2006, Seattle, WA, Edited by M.J. Jackson, ASM International, pp. 210-216 (2006).

Evidence supporting Allegation 1.2a was presented. The accuracy of Allegation 1.2a depends on whether appropriate permission to use the Figure 14 was granted or not. However, the statements of the Complainants and Respondent are at odds over this fact.

Allegation 1.2a concerns the Respondent's reproduction of Figure 14, which is identical to an image published by the Complainants in Brown et al. (2002). Brown et al. (2002) is not cited in the paper rather the Figure is acknowledged with the phrase "Courtesy of Chandrasekara" (note Respondent's misspelling of Chandrasekar). The Complainants deny that the Figure was provided by any of them and claim that the statement implying consent to publish is false.

If found to be true, this allegation would satisfy the definitions of plagiarism and fabrication in Policy VIII.3.1.

Evidence supporting Allegation 1.2b was presented. Allegation 1.2b (about Figure 15) deals with a figure for which there is no attribution provided, and Bala Rao's material [B. Rao, "Consolidated of Nanocrystalline Materials," Internal group presentation, W. Lafayette, IN, October 2005] pre-dates the respondent's publication (2005 vs. 2006). However, even if the Respondent's rebuttal claim that permission to use Figure 15 was obtained is true, permission to use does not lessen the duty of attribution.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.3. Alleged Research Misconduct in M.J. Jackson, G.M. Robinson, M.D. Whitfield, "Manufacturing of nanocrystalline metals by machining processes," *Journal of Achievements in Materials and Manufacturing Engineering*, Volume 20, Issues 1-2, January-February 2007. Received 03.11.2006; accepted in revised form 15.11.2006 (i.e., November 2006).

Evidence supporting Allegation 1.3a was presented. Allegation 1.3a concerns the reproduction as Figure 3 of the above referenced paper of an image published by the Complainants in Brown et al (2002) without attribution which is disputed in the rebuttal provided by the Respondent.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Evidence supporting Allegation 1.3b was presented. Allegation 1.3b concerns the reproduction as Figure 4 of the above referenced paper of images produced by the Complainants and included in the Bala Rao presentation from 2005 without attribution which is disputed in the rebuttal provided by the Respondent. Further, content from the text of the Respondent's paper referenced above appears to be identical to the Complainant's published results for a nickel-based alloy Inconel.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Evidence supporting Allegation 1.3c was presented. Allegation 1.3c concerns a statement made in the Acknowledgement section of the Respondent's paper referenced above. The Complainants allege that the statement is false.

If found to be true, allegation 1.3c would represent fabrication as defined in Policy VIII.3.1.

Allegation 1.4. Alleged Research Misconduct in M.J. Jackson, <u>MICRO AND</u> <u>NANOMANUFACTURING</u> (2007) Springer, New York, NY. (Approximately 690 pages). Chapter 12: Micro- and Nanomanufacturing. Section 12.3.7 Nanomanufacturing by Machining, pp. 664-671. Article 1.4 consists of an extract from *Chapter 12 of Micro and Nonomanufacturing*, a work intended to serve as a textbook for undergraduate and graduate courses as stated in the preface.

Allegation 1.4a. Evidence supporting Allegation 1.4a was presented. The Complainants allege that certain images they originated were plagiarized by the Respondent and the evidence supports the allegation despite one misidentification by the Complainants. The Copyright notice in Brown et al (2002) states that the copyright is owned by The Materials Research Society, not the Journal of Materials Research as the Complainants assert. Nevertheless, the Respondent would have been expected to seek permissions from the copyright owner, and provides no evidence of doing so. Furthermore, the only gesture towards citation the Respondent offers is "Courtesy of S Chandrasekara (sic)," instead of Brown, et al., where it was published. Under 12.27 in the record of permissions that needed to be sought supplied by the Respondent, "N" is marked in the Permissions Required column, implying that he did not think this image needed permission.

If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4b.Figure 12.28. Evidence supporting Allegation 1.4b was presented. Complainants allege that Respondent plagiarized four TEM images they originated and the evidence supports the allegation. These images correspond to the image in the Leeds-Lyons symposium as the Complainants assert and discuss more thoroughly in allegation 1c. There the Complainants assert that 3 of the images have been previously published in Swaminathan et. al but not the grouping, which has, however, appeared in various of their presentations. They do not identify the figure in Swaminathan et. al containing 3 of the images, but it appears to be Figure 12. Figure 12.28 in Jackson is identified as "Courtesy of S. Chandresekara(sic)" but does not cite Swaminathan et al.

If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4c. Evidence supporting Allegation 1.4c was presented. Complainants allege that Figure 12.29 plagiarizes the images in slide 6 in their Leeds-Lyons symposium presentation as well as their text in the left-hand margin.

If found to be true, this use of images would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4d. Evidence supporting Allegation 1.4d was presented. Complainants allege plagiarism of an image produced by them. They assert that the chart in Figure 12.30 was produced by them and used in a conference presentation provided as source 4 and again in the M.S. thesis of provided as source 7.

If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4e. Evidence supporting Allegation 1.4e was presented. Complainants allege plagiarism of images originated by them due to lack of citation. Figure 12.31 contains 3 images

from the Complainants' work found in the Leeds –Lyons symposium presentation, slide 9 and is neither acknowledged nor credited.

If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4f. Evidence supporting the allegation was presented. Complainants allege plagiarism of frames in Figure 12.32 from a film produced by them. They supplied the Inquiry committee with the film. The same image is also found in slide 11 of the Leeds-Lyon symposium presentation.

If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4g. Evidence supporting the allegation was presented. Complainants allege that Figure 12.33 plagiarizes five micrographs of chip particles they produced and presented at the Leeds-Lyon Symposium. Respondent's citation is inadequate, stating only "Courtesy of S Chandresekara (sic)."

If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4h. Evidence supporting Allegation 1.4h was presented. Complainants allege that Respondent plagiarized some of their images presented at the Leeds-Lyon symposium. Again the Respondent has only offered "Courtesy of S. Chandresekara" as a citation.

If found to be true, this use of an image would represent plagiarism as defined in Policy VIII.3.1.

Allegation 1.4i. The Complainants allege plagiarism of style in text starting at the top of page 655 in Chapter 12, Section 12.3.7. There is an inconsistency in the complaint: page 655 is not in section 12.3.7. We assume that the Complainants mean page 665. Page 665 seems to be discussing the same topic and using some of the same words as paragraph 6 in Brown et al., (alleged source 1), p. 2484, but we do not believe this represents plagiarism as defined in Policy VIII.3.1, merely two different statements of facts. These allegations of style plagiarism touch on a very gray area in which the means to objectivity are lacking.

The allegation does not satisfy the definition of plagiarism in Policy VIII.3.1, is not supported by any evidence, and does not merit further investigation.

Allegation 1.5. Alleged Research Misconduct in M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008. Received 20 June 2007; accepted in revised form 6 August 2007. This paper was not complete in the supporting materials provided by the Complainants. The Inquiry Committee downloaded and printed it from Purdue's online subscription.

Allegation 1.5a. Evidence supporting Allegation 1.5a was presented. Complainants allege plagiarism due to false citation.

If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1.

Allegation 1.5b. Evidence supporting Allegation 1.5b was presented. Allegation is plagiarism due to false citation.

If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1.

Allegation 1.5c. Evidence supporting Allegation 1.5c was presented. Complainants allege plagiarism in Respondent's Figure 5 due to false citation and the allegation is supported by the evidence. This bar chart is found in Saldana's thesis [C.J. Saldana, "Nanostructured Particulate by Modulation-Assisted Machining," M.S. Thesis, Purdue University, December 2006] and not in Brown et al. as Respondent's citation indicates.

If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1.

Allegation 1.5d. Evidence supporting Allegation 1.5d was presented. Allegation is plagiarism due to false citation. Figure 6 does indeed look like slide 14 in Complainant's source # 4, "Direct Production of Nanocrystalline Particulate and Consolidation," a presentation to the SAE. The respondent claims that the MAM device portrayed here is based on ideas developed prior to his joining Purdue University and asserts that the ideas are his and those of his co-authors.. The Respondent has supplied a copy of a patent application for "Piezoelectric nano surface machining," dated 6/19/2003 which may or may not be the same item in the image, or a prototype of it. Respondent does not identify which image in the "Proof of Concept for this Novel Idea" is the item in question and none looks like it.

If found to be true, this allegation satisfies the definition of plagiarism in Policy VIII.3.1.

Allegation 1.5e. Evidence supporting Allegation 1.5e was presented. Complainants allege plagiarism due to false citation as well as falsification by incorrect description in the caption. Evidence supporting these allegations is found in previous allegations 1.1f and 1.4e, which discuss the same images.

If found to be true, this allegation satisfies the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.5f. Evidence supporting Allegation 1.5f was presented. Allegations are plagiarism due to absence of citation and falsification due to misinformation supplied by Respondent in his description. Complainants allege that Figures 14-21 are frames from a movie made by the Complainant's graduate student. Review of the video supplied by the Complainants appears to support the allegation that Figures 14-21 are the same as frames from the video. Complainants also assert that Respondent provides information in the Experimental Procedures section that contradicts the rake angle shown in the video, therefore resulting in falsification. The Complainants are correct in their assertion that the rake angle of -35 degrees is outside the range of Respondent's table showing various rake angles of -5 to -23.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.5g. Allegation is "word-for-word paraphrasing and style plagiarism of Brown et al." It is not supported by the evidence. It is true that the first sentence on page 1454 immediately under the heading "Chip formation with modulation" is close in wording to the first sentence in Brown et al. and the section basically summarizes some of the facts first reported in the Brown article. These alone do not constitute plagiarism, however, because Respondent clearly cites Brown et al (Complainants' source #1) in his text and gives a complete citation in his References list at the end of the article.

This allegation does not satisfy the definition of plagiarism in Policy VIII.3.1, is not supported by the evidence provided, and does not warrant further investigation.

Allegation 1.6. Alleged Research Misconduct in M.J. Jackson, J.S. Morrell and WE. Ahmed, "Shear strain induced formation of nanostructured pure metals," *International Journal of Nanoparticles*, Volume 1, Number 1, pp. 271-282, 2008.

Evidence supporting Allegation 1.6 was presented. This allegation of plagiarism of images and falsification of text is almost the same as Allegation 1.5f above. Complainants assert that the only difference in the text describing the images from their description in allegation 1.5f is the change of the cutting tool diameter and the change of the two metals being cut from tin and lead to iron and copper. Review of the video supplied by the Complainants appears to substantiate that the Figures identified are the same as frames from the video, and no citation is offered. As for the falsification allegation, it is true that the type of metal listed in the offending paper has changed from iron to copper, but so has the other information, rake angle, shear plane angle, etc. It is not clear to a non-expert that Table 1 is actually referring to what is happening in the frames taken from the film. This matter requires further consideration. The diameter of the cutting tool was not provided in this paper either.

If found to be true, allegation 1.6 would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.7. Alleged Research Misconduct in M.J. Jackson, M.D. Whitfield and W. Ahmed. "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp. 326-341, 2009.

The abstract and the body of the paper cited in Allegation 1.7 have extensive overlaps with the paper included in Allegation 1.6 (Jackson et al., "Shear strain induced formation of nanostructured pure metals," *International Journal of Nanoparticles*, Vol. 1, No. 1, pp 271-282, 2008).

Allegation 1.7a. Evidence supporting Allegation 1.7a was presented. Both of the above papers (Allegations 1.6 and 1.7) appear to reproduce figures and other experimental data from the work of the Complainants (list included in the allegation letter) without attribution. In addition, the

identification of the data was done incorrectly. To be specific, Fig. 3 of the paper in Allegation 1.7 uses images from the Complainants' work (mentioned in Allegations 1.1c, 1.4b, and 1.5b). In addition, the caption in Fig.3 wrongly attributed the information to Brown et al. (2002).

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.7b. Evidence supporting Allegation 1.7a was presented. Figs. 9-12 appear to be reproduced from the Complainants' work, also apparently reproduced by the Respondent in papers included in Allegations 1.5 and 1.6, without any attribution.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.7c. Evidence supporting Allegation 1.7c was presented. The section on experimental procedure closely resembles the experimental section in the paper included in Allegation 1.5 except that the metals were wrongly identified and some of the values were wrongly interpreted creating false information.

If found to be true, allegation 1.7c would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.8. Alleged Research Misconduct in M.J. Jackson and J.S. Morrell, Editors, <u>Machining with Nanomaterials</u> (2009), Springer, New York, N.Y. *Chapter 9: Formation of Nanostructured Metals by Machining*, M.J. Jackson, J.J. Evans, C. Xu and W. Ahmed, pp 297-323.

Evidence supporting allegations that the chapter made an extensive use of images and graphs from the Complainants' work without attribution or permission was presented.

Allegation 1.8a. Evidence supporting Allegation 1.8a was presented. Figure 9.3 of the above article appears to come from the Complainants' work without attribution and it was done so repeatedly as indicated in Allegations 1.1b, 1.2a, 1.3a, 1.4a, and 1.5a.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.8b. Evidence supporting Allegation 1.8b was presented. Figure 9.4 appears to come from Complainants' work without attribution as indicated in Allegations 1.1c, 1.4b, 1.5b and 1.7a. In addition, the figure was wrongly attributed to Brown et al. (2002) and published without permission.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.8c. Evidence supporting Allegation 1.8c was presented. Figure 9.5 appears to come from the Complainants' work mentioned in Allegations 1.1d and 1.5c, incorrectly attributed to Brown et al. (2002) and published without permission.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.8d. Evidence supporting Allegation 1.8d was presented. Figure 9.6 appears to come from the Complainants' work mentioned in Allegations 1.1e and 5d, with no reference and published without permission.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in Policy VIII.3.1.

Allegation 1.8e. Evidence supporting Allegation 1.8e was presented. Figure 9.7 appears to come from the Complainants' work mentioned in Allegations 1.1f, 1.4e and 1.5e, wrongly attributed to Brown et al. (2002) and published without permission.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.8f. Evidence supporting Allegation 1.8f was presented. Figures 9.14-9.21 are from the Complainants' movie mentioned in Allegations 1.5f and 1.6.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegation 1.8g. Evidence supporting Allegation 1.8g was presented. It appears thatparts of the article used paraphrased sentences from Brown et al. (2002) which was cited only at the end of the second paragraph of Section 9.2.2.

If found to be true, this allegation would satisfy the definitions of plagiarism and falsification in *Policy VIII.3.1.*

Allegations 2.1 and 2.2. Alleged Research Misconduct in M.J. Jackson, Editor, *Microfabrication and Nanomanufacturing*, CRC Press, New York, N.Y. "Chapter 4. The Size Effect in Micromatching" by Shaw and Jackson, pp 87-109, 2006; and M.J. Jackson, *Micro and Nanomanufacturing*, Springer, New York, N.Y. "Chapter 4. Meso-Micromachining", pp 143-190. 2007.

Evidence supporting the allegation that the above two book chapters extensively reproduce material from a paper by Shaw, "The size effect in metal cutting," *Sadhana*, Indian Academy of Sciences, Vol. 28, Part V, pp 875-896. October, 2003, without attribution, was presented.

No evidence is given by the Respondent indicating that Milton Shaw (deceased on September 7, 2006) agreed to serve as a co-author of the first paper. The second paper, where Jackson is the sole author, reproduces material from Shaw's 2003 paper without attribution.

If found to be true, allegations 2.1 and 2.2 would satisfy the definition of plagiarism in Policy VIII.3.1.

General Observation

The Respondent's Rebuttal to Specific Allegations 1.4-1.6 seems to reflect confusion between Copyright and Plagiarism. Others' work should always be credited regardless of its copyright status.

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From:	Jackson, Mark J
To:	Dunn, Peter E.
Cc:	Jackson, Mark J
Subject:	Allegation of Potential Research Misconduct - Comments on the Draft Report and Correspondence
Date:	Monday, June 13, 2011 10:34:58 PM

Dear Peter,

Thank you for allowing me to respond to the draft report of the inquiry committee and correspondence.

Considering the 'Correspondence' section of the inquiry, the following is noted:

1. When one looks at the responses from and it appears that there are some discrepancies concerning my presence and my student's presence in the Michael Golden Laboratories. acknowledges my presence and that of my students and this is backed up by the large volume of material samples that I provided to you in terms of evidence at the beginning of this inquiry. Also, photographs of equipment used by my students in their theses/dissertations were all say that I and my students did not have access taken in the area that and to. This is very perplexing indeed as this arrangement was agreed by them and by Prof. when I started working at Purdue University in August 2004. It is also noted that Prof and my students have not been contacted throughout this investigation to verify this fact. In this instance, the material samples nor evidence provided by the respondent's former students and Prof. have been taken into consideration in the formulation of the draft report of the inquiry committee.

2. and state that they did not have a personal working relationship with me. This is incorrect as I was invited to work on a TAP project with both of them on behalf of Fort Wayne Metals back in the Fall of 2004 on the centerless grinding of stainless steel and other alloys. In fact, a meeting was arranged and both Prof. and Dr. attended the meeting with myself and a representative from Fort Wayne Metals. Previous professional encounters have been associated with modulated assisted machining and grinding through previous industrial relationships. It is also stated that myself, Mr. Whitfield and Dr. Robinson have engaged in numerous meetings with Dr. Mann regarding the development of equipments for modulated assisted machining leading to the submission and granting of intellectual property rights that have excluded the respondent and his colleagues. This information is documented but does appear to have been considered during the formulation of the draft report of the inquiry committee.

3. states that he indeed provided the respondent with a copy of the materials used in the publications and stated that he allowed me and my students to use such material on the basis that Prof.

be acknowledged in the publications. Although he specifically mentions the provision of video footage, the CD provided to the enquiry committee provides presentations in his name only that excludes his colleagues such as and his research work. The information provided to me by Dr. Mann was stated by him to be his own work. If work was used in error then that information was not provided to me by Dr. Mann. Again, the information provided to me by Dr. Mann is documented and provided to the committee but does appear to have been considered during the formulation of the draft report of the inquiry committee.

Considering the 'Draft Report of the Inquiry Committee' section of the inquiry, the following is noted:

1. The respondent asserts that fabrication of data has not taken place. The evidence provided to the inquiry committee via the various notebooks and physical material samples suggests that the results have been proven to be true using the equipment provided by Prof. Chadrasekar to the respondent and his students. This information is documented but does appear to have been considered during the formulation of the draft report of the inquiry committee.

2. The respondent asserts that plagiarism of results and text has not taken place. The evidence provided to the inquiry committee in the form of various notebooks and material samples suggests that the work conducted was formulated and carried out by the respondent and his students. This information is documented but does appear to have been considered during the formulation of the draft report of the inquiry committee.

3. The respondent asserts that falsification of results has not taken place. The evidence provided to the inquiry committee in the form of various notebooks, electronic samples and physical samples suggests that the work conducted was formulated and carried out by the respondent and his students. This information is documented but does appear to have been considered during the formulation of the draft report of the inquiry committee. The respondent asks the inquiry commitee to consider all the evidence provided and not samples of the evidence.

In conclusion, the respondent asks the committee to consider all of the evidence provided in the enquiry and not just a sample of the evidence as demonstrated in the draft report. Also, the draft report is biased towards the case of the complainants owing to the fact that statements provided by alone clearly supports the complainants idea that the respondent and his students were not allowed access to the Michael Golden Laboratories. The report should be balanced by asking the respondent's students who used those facilities to confirm that they were granted access to those laboratories and that they used equipment in those laboratories, and by contacting Dr. who mediated between the respondent, his students and the complainants between the 2004 and 2009 academic years.

The respondent asks that these points be considered by the inquiry committee prior to formulating the final report.

Yours sincerely, Prof. Mark J. Jackson, Ph. D.

Inventory of Evidentiary Documents

- 1. Purdue University Policy III.A.2: Research Misconduct.
- 2. Memo dated April 23, 2010 to Peter Dunn from
 - and (Complainants) re: Allegation of Research Misconduct by Prof. Mark J. Jackson and co-authors, with enclosures.
 - a. Enclosure 1: Overview
 - b. Enclosure 2: Supporting Details
 - c. Enclosure 3: Some Related Publications: References
- 3. Supporting materials provided by Complainants.
 - a. Publications by Complainants
 - T.L. Brown, S. Swaminathan, S. Chandrasekar, W.D. Compton, A.H. King, and K.P. Trumble, Low-cost manufacturing process for nanostructured metals and alloys, Journal of Materials Research, 17 [10], 2484-2488 (2002).
 - S. Swaminathan, M.R. Shankar, B.C. Rao, W.D. Compton, S. Chandrasekar, A.H. King, and K.P. Trumble, Severe plastic deformation (SPD) and nanostructured materials by machining, Journal of Materials Science, 42 1529-1541 (2007).
 - iii. J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W.D. Compton, "Direct Production of Particulate with Nanocrystalline Microstructure by Modulation-Assisted Machining," Presented at Leeds-Lyon Tribology Symposium, Lyon, France, September 2005.
 - iv. J. Mann, C. Saldana, E. Paulus, S. Chandrasekar and W.D. Compton, "Direct Production of Particulate and Consolidation," Presented at Society of Automotive Engineers, SAE Aerospace, October, 2005.
 - v. S. Chandrasekar, K. Trumble, and W.D. Compton, Nanocrystalline Materials by Machining, Presented at National Laboratory, Oak Ridge, TN, February, 2006.
 - vi. S. Chandrasekar, W.D. Compton, J. Mann, and Bala Rao,
 "Nanocrystalline Materials by Large Strain Machining," Presented at Purdue University to representatives from US Army Research, W. Lafayette, IN, April 2006.
 - vii. C.J. Saldana, "Nanostructured Particulate by Modulation-Assisted Machining," M.S. Thesis, Purdue University, December 2006. Title page, Acknowledgements, Table of Contents, List of Tables, List of Figures, Abstract, p65, p73.
 - viii. B. Rao, "Consolidation of Nanocrystalline Materials," Internal group presentation, . Lafayette, IN, October 2005.
 - b. Publications by Respondent
 - M.J. Jackson, M.D. Whitfield, G.M. Robinson and W. Ahmed, "Surface Coatings Deposited Using Recycled Machining Chips and Turnings," in: <u>Surface Engineering</u>, *Proceedings of the 5th International Surface Engineering Congress*, May 15-17, 2006, Seattle, WA, Edited by M.J. Jackson, ASM International, pp. 155-160 (2006).

- M.J. Jackson, G.M. Robinson, M.D. Whitfield, R.G. Handy, W. Ahmed and H. Taylor, "Micro and Nanomanufacturing Technologies – The Case for Using Thermal and Cold Spray Techniques," in: <u>Surface Engineering</u>, *Proceedings of the 5th International Surface Engineering Congress*, May 15-17, 2006, Seattle, WA, Edited by M.J. Jackson, ASM International, pp. 210-216 (2006).
- M.J. Jackson, G.M. Robinson, M.D. Whitfield, "Manufacturing of nanocrystalline metals by machining processes," *Journal of Achievements in Materials and Manufacturing Engineering*, Volume 20, Issues 1-2, January-February 2007. Received 03.11.2006; accepted in revised form 15.11.2006 (i.e., November 2006).
- iv. M.J. Jackson, <u>MICRO AND NANOMANUFACTURING</u> (2007) Springer, New York, NY. (Approximately 690 pages). Chapter 12: Micro- and Nanomanufacturing. Section 12.3.7 Nanomanufacturing by Machining, pp. 664-671.
- v. M.J. Jackson, M.D. Whitfield, J.S. Morrell, W. Ahmed, and J.P. Davim, "Initial shear strain development during formation of nanostructured metal chips," *Materials Science and Technology*, Volume 24, Number 12, 2008. Received 20 June 2007; accepted in revised form 6 August 2007.
- vi. M.J. Jackson, J.S. Morrell and W.E. Ahmed, "Shear strain induced formation of nanostructured pure metals," *International Journal of Nanoparticles*, Volume 1, Number 1, pp. 271-282, 2008.
- vii. M.J. Jackson, M.D. Whitfield and W. Ahmed. "Formation of nanostructured metal particles using negative rake angle cutting tools," *International Journal of Nanomanufacturing*, Volume 4, Numbers 1/2/3/4, pp. 326-341, 2009.
- viii. M.J. Jackson and J.S. Morrell, Editors, <u>Machining with Nanomaterials</u> (2009), Springer, New York, N.Y. *Chapter 9: Formation of Nanostructured Metals by Machining*, M.J. Jackson, J.J. Evans, C. Xu and W. Ahmed, pp 297-323.
- 4. Letter dated July 23, 2010, to Professor Mark J. Jackson from Peter E. Dunn informing Respondent of allegations of potential Research Misconduct.
- 5. Email dated August 2, 2010, from Mark J. Jackson to Peter E. Dunn, re: Rebuttal, with attachment.
 - a. Attachment: Rebuttal Concerning Allegation of Research Misconduct by Prof. Mark J. Jackson (MET) and Co-Authors (dated July 31, 2010)
- 6. Email to Mark Jackson from Peter E. Dunn dated August 2, 2010, re: receipt, with attachment.
 - a. Attachment: Letter to Professor Mark Jackson from Peter E. Dunn dated August 2, 2010, acknowledging receipt of evidentiary materials in two boxes.
- 7. Email to Peter E. Dunn from Mark Jackson dated August 10, 2010, re: Research notebooks, reporting that additional evidentiary materials were available for delivery.
- 8. Email to Mark Jackson from Peter E. Dunn dated August 10, 2010, re: Receipt suppl, with attachment.
 - a. Attachment: Letter to Professor Mark Jackson from Peter E. Dunn dated August 10, 2010, acknowledging receipt of additional evidentiary materials.

- 9. Memo dated January 28, 2011 to Professor Mark J. Jackson from Peter E. Dunn informing Respondent of additional allegations of potential Research Misconduct with enclosures.
 - a. Enclosure 1: Milton C. Shaw and Mark J. Jackson, "4. The Size Effect in Micromachining," in <u>Microfabrication and Nanomanufacturing</u>, Mark J. Jackson, Editor, CRC Press, Boca Raton, FL, 2006, pp. 87-109.
 - Enclosure 2: "4. Meso-Micromachining" in <u>Micro and Nanomanufacturing</u>, Mark J. Jackson, Springer Science+Business Media, LLC, New York, NY, 2007, pp. 143-190.
 - c. Enclosure 3: Milton C. Shaw entitled "The size effect in metal cutting" published in *Sadhana* Vol. 28, Part 5, October 2003, pp. 875-896.
- 10. Letter to from Peter E. Dunn, dated March 1, 2011, posing questions regarding personal interactions with Mark J. Jackson.
- 11. Letter to Peter E. Dunn from , dated March 5, 2011, responding to Item 10.
- 12. Email to Peter E. Dunn from Mark Jackson dated March 27, 2011, re: Response needed, transmitting updated rebuttal of allegations, with attachment.
 - Attachment: Confidential Rebuttal to Allegation of Research Misconduct MJJ
 2.pdf (amendment to Item 7.a., dated July 31, 2010).
- 13. Email to Peter E. Dunn from Mark Jackson dated March 30, 2011, re: Response needed, reporting that additional evidentiary materials would be delivered on that date.
- 14. Supporting materials provided by Mark J. Jackson on March 30, 2011.
 - a. Letter dated June 19, 2003 from United States Patent and trademark Office to Tennessee Technology University acknowledging receipt of provisional Patent Application 60/468,147.
 - b. Document titled "Piezoelectric Nano Surface Machining, Proof of Concept For This Novel Idea" by L. Hyde, G. Robinson, F. Underdown, M. Jackson.
 - c. Tennessee Technological University Invention Disclosure Form for Disclosure 03-004-10, dated 4-14-03.
 - d. Copies of emails between Frank Underdown, Jr. and Mark Jackson dated May 20, 2003, April 14, 2003, April 15, 2003, April 15, 2003.
 - e. Copy of Retro Search results; Question No. 1191227.017 Piezoelectric Nanogrinding.
 - f. Copy of Retro Search results; Question No. 1191227.019 Piezoelectric Nanogrinding Run 2.
 - g. Copy of email from Mark Lynam to Frank Underdown and Mark Jackson, dated May 1, 2003, re: Piezoelectric Nano Grinding: Additional Comments.
 - h. Copies of PowerPoint slides titled "Nanogrinding," "Nanogrinding Cont.," "Piezoelectric Nanogrinding."
 - i. Copy of letter to Professor Milton C. Shaw from Mark J. Jackson, dated 29 May 2002.
 - j. Copy of letter to Mark J. Jackson from Milton C. Shaw, dated September 1, 2002, with enclosed manuscript titled "The size effect in metal cutting," by Milton C. Shaw and M.J. Jackson.
 - k. Copies of multiple permission requests for reuse of text, figures and tables, with associated correspondence.

- 1. Copies of multiple, additional permission requests for reuse of text, figures and tables, with associated correspondence.
- 15. Letter to Professor Mark J. Jackson from Peter E. Dunn, dated April 1, 2011, re: Allegation of Potential Research Misconduct – Inquiry Committee.
- 16. Letter to from Peter E. Dunn, dated April 8, 2011, posing questions regarding personal interactions of Prof. Chandrasekar and research group with Mark J. Jackson.
- 17. Letter to Peter E. Dunn from , dated April 20, 2011, responding to Item 16.
- 18. Letter dated June 30, 2011, to Professor Mark J. Jackson from Peter E. Dunn transmitting Final Report of Inquiry Committee and providing Notice of Investigation with enclosure.
 - a. Enclosure: Memo dated June 29, 2011 from Inquiry Committee to Peter E. Dunn re: Final Report of the Inquiry Committee in the Matter of Mark J. Jackson.
- 19. Letter to Mark Jackson from Peter E. Dunn dated August 5, 2014, transmitting additional copy of Inquiry Committee's Final Report and notice of Investigation.
- 20. Letter to Mark Jackson from Peter E. Dunn dated October 22, 2014, re-transmitting correspondence and Final Report of Inquiry Committee from August 2, 2014, and nominating members of Investigation Committee.
- 21. Email to Peter E. Dunn from Mark Jackson dated October 30, 2014, re: Confidential, acknowledging receipt of correspondence dated October 22 and August 5, 2014, and requesting contact information for attorney.
- 22. Email to Mark Jackson from Peter E. Dunn dated October 31, 2014, re: Confidential, providing to Respondent contact information for William Kealey and confirming that no conflicts of interest had been identified for proposed members of the Investigation Committee.
- 23. Memo dated December 4, 2014, to Investigation Committee Members from Peter E. Dunn re: Investigation Committee Charge in the Matter of Mark J. Jackson.
- 24. MET Annual Reports
 - a. MET Annual Report 2004-2005
 - b. MET Annual Report 2005-2006
 - c. MET Annual Report 2006-2007
 - d. MET Annual Report 2008-2009
 - e. MET Annual Report 2009-2010
 - f. MET Annual Report 2010-2011
- 25. Mark Jackson Faculty Annual Reports
 - a. Jackson, Mark Faculty Annual Activity Report: July 1, 2009-June 30, 2010
 - b. Jackson, Mark Faculty Annual Activity Report: July 1, 2010-June 30, 2011
 - c. Jackson, Mark Faculty Annual Activity Report: July 1, 2010-June 30, 2011 (Corrected)
- 26. Mark Jackson Nomination for Promotion to Associate Professor with Tenure, November 2006
- 27. Mark Jackson Nomination for University Faculty Scholar
- 28. Letter to

, dated May 1, 2015, transmitting initial questions to prepare for interview with Investigation Committee scheduled on Friday, May 8, 2015, at 9 am.

- 29. Letter to from Peter E. Dunn, dated May 1, 2015, transmitting initial questions to prepare for interview with Investigation Committee scheduled on Friday, May 8, 2015, at 11 am.
- 30. Corrected transcript of interview with on Friday, May 8, at 9 am.
- 31. Corrected transcript of interview with on Friday, May 8, 2015 at 11 am.
- 32. Letter to from Peter E. Dunn, dated June 1, 2015, transmitting initial questions to prepare for interview with Investigation Committee scheduled on Wednesday, June 3, 2015, at 1:30 pm.
- 33. Transcript of interview with on Wednesday, June 3, 2015, at 1:30 pm.
- 34. Letter to Mark J. Jackson from Peter E. Dunn dated June 26, 2015, transmitting initial questions to the Respondent for written response by July 20, 2015, with attachment.a. Attachment: Questions for Respondent.
- 35. Document titled "Answers in relation to questions provided by the Investigating Committee on June 26, 2015" dated June 20, 2015, received via Dropbox on July 20, 2015.
- 36. Email thread to Peter E. Dunn from Bonded Abrasives dated July 27, 2015, re:Update and logistics for meetings next week, acknowledging receipt of item 34 and transmission of item 35; scheduling interview of Mark Jackson with Investigation Committee in Lafayette, IN, on Friday, July 24, 2015 at 9 am; explanation for failure to appear for interview on Friday, July 24, 2015.
- 37. Email thread to Peter E. Dunn from Bonded Abrasives dated November 4, 2015, re: Interview via Skype, scheduling interview of Mark Jackson with Investigation Committee on Saturday, November 21, 2015, via Skype.
- 38. Letter to Mark Jackson from Peter E. Dunn dated November 16, 2015, delivered by process server, transmitting Investigation Committee's Preliminary Draft Summary of Findings of Fact and Tentative Conclusions.
 - a. Enclosure: Preliminary Draft Findings of Fact and Tentative Conclusions dated November 16, 2015.
- 39. Email to Peter E. Dunn from Bonded Abrasives dated November 18, 2015, re: Skype interview, acknowledging receipt of item 38.
- 40. Email to Bonded Abrasives from Peter E. Dunn dated November 19, 2015, re: Skype interview, responding to item 39.
- 41. Email to Peter E. Dunn from Bonded Abrasives dated November 19, 2015, re: Skype interview responding to item 40.
- 42. Email to Bonded Abrasives from Peter E. Dunn dated November 20, 2015, re: Skype interview, responding to item 41.
- 43. Email from Bonded Abrasives to Peter E. Dunn dated November 20, 2015, re:Skype interview responding to item 42.
- 44. Transcript of interviews with Mark J. Jackson via Skype and with Peter E. Dunn in person, on Saturday, November 21, 2015, at 9:00 am.
- 45. Letter to from Peter E. Dunn dated December 1, 2015 asking questions raised by November 21, 2015 interview with Mark J. Jackson.
- 46. Email to Bonded Abrasives from Peter E. Dunn dated December 4, 2015, re: Transcript of testimony, notifying Mark Jackson of availability of transcript of testimony and requesting review and corrections.

- 47. Response from to questions posed in item 45; received via email dated December 9, 2015.
- 48. Email to Peter E. Dunn from dated December 9, 2015, re: Available by phone; providing clarification to response to questions from item 45.
- 49. Email to Complainants from Peter E. Dunn dated December 11, 2015, re: Questions to Complainants with attach, requesting additional information from Complainants.
- 50. Email to Peter E. Dunn from dated December 16, 2015, re: Questions, with attachment: MSEA-2005.pdf; responding to question 1 from item 49.
- 51. Email to Peter E. Dunn from dated December 17, 2015, re: Questions; responding to question 2 from item 49.
- 52. Copy of video clip titled "Sideview_negativerake_lead.avi" dated May 21, 2007 provided by .
- 53. Letter to Mark Jackson from William Kealey dated November 4, 2014, re: Purdue University Proceeding under Policy III.A.2; response to email from Mark Jackson to William Kealey dated November 2, 2014.
- Letter to Peter Dunn from William Kealey dated July 15, 2015 confirming receipt of four sealed boxes containing evidentiary materials provided by Mark Jackson on August 2, 2010 and August 10, 2010.
- 55. Inventory of the contents of boxes delivered to Peter E. Dunn by Mark J. Jackson on August 2, 2010 and August 10, 2010; Excel file.