Faculty Council Nuclear Engineering Report, Follow-up Questions and Responses
February 28, 2014

This document was compiled by Jay Dow, Professor of Political Science, Paul Ladehoff, Director of the LL.M. in Dispute Resolution program, Bill Wiebold, Professor of Plant Sciences, and Bill Lamberson, Professor of Animal Sciences (chair) to respond to questions related to the “Nuclear Engineering Report: A Brief History of Nuclear Sciences at the University of Missouri” submitted to the Faculty Council January 23, 2014. Readers are encouraged to read this document in conjunction with that report (appended). The committee was appointed by Craig Roberts, Chair of Faculty Council, on September 18, 2013, and given the charge to develop a succinct history of the administrative structure affecting the Nuclear Sciences Engineering Institute (NSEI) beginning with its move from the College of Engineering to the Graduate School, including timelines, program reviews, proposals for moving back to an academic department, and the current status. Membership of the committee was endorsed by the Chancellor, the Dean of Engineering, and the NSEI faculty.

Question 1 (from Professors Loyalka and Prelas)
It is stated, “The evidence is that NSEI properly trains graduate students, albeit in a narrow band of nuclear engineering.”
Would the Committee clarify that NSEI properly trains students in Nuclear Power, Health Physics and Medical Physics, within a nuclear engineering MS and PhD degree structure? The Medical Physics part of the program was deemed sufficiently strong by CAMPEP (the accreditation board) in fall 2011 to be granted accreditation for both the MS and PhD effective Jan. 2010 for a period of three years (end of 2013, with provisions for extensions beyond). Of course, as is typical with most nuclear/radiological programs not all specializations in these fields can be covered, or are being covered. Focus is essential for excellence in research (and extramural funding) at the cutting edges.

Committee Response:
The committee notes the excellence of the NSEI faculty, but makes the point that from the broader campus perspective there has been a loss of opportunity because of lack of critical mass under the current structure relative to a more optimal structure. See the 2010 review, page 4, paragraph 2, “Because the current NSEI faculty is so small it is not able to cover all of the traditional nuclear power educational and research areas, and thus some significant areas, such as reactor physics and analysis, thermal hydraulics, safety and design, radiation shielding, and nuclear materials are not well represented. The five current faculty members have been able to provide minimal coverage of these core nuclear power engineering disciplines, but they are stretched to provide coverage of all nuclear power engineering relevant topical areas. The current organization of NSEI, while nominally providing the vehicle for bringing together faculty members from across the university for research and academic programs in nuclear science and engineering, does not have the resources needed to function as an independent institute, keeping NSEI from achieving its goal as being the focused leader of nuclear activities across campus.”

Question 2 (from Professors Loyalka and Prelas)
It is also stated, “However, the campus and College of Engineering teaching and research profiles in nuclear engineering may be limited by the current organizational structure.” The table below shows the degree productivity of NSEI over the last three years together with those of other departments in the College of Engineering (we have included some departments from A&S also).
Degrees granted in some of the STEM areas at MU (Three Year (FY11, 12, 13) Averages)  
(Reference: R. Sade, IR&P 2013, Report 2 Appendix)

<table>
<thead>
<tr>
<th>Unit</th>
<th>Approx.# of T/TT Faculty</th>
<th>BS</th>
<th>MS</th>
<th>PhD</th>
</tr>
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<tbody>
<tr>
<td><strong>College of Arts &amp; Science</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>43</td>
<td>255</td>
<td>3.0</td>
<td>13.7</td>
</tr>
<tr>
<td>Chemistry</td>
<td>22</td>
<td>31</td>
<td>3.3</td>
<td>10</td>
</tr>
<tr>
<td>Math</td>
<td>37</td>
<td>23.3</td>
<td>13.6</td>
<td>8</td>
</tr>
<tr>
<td>Physics</td>
<td>32</td>
<td>14.3</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td><strong>College of Engineering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>16</td>
<td>45.3</td>
<td>7.3</td>
<td>6.3</td>
</tr>
<tr>
<td>Chemical</td>
<td>9</td>
<td>40.7</td>
<td>6.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Civil</td>
<td>18</td>
<td>82.3</td>
<td>18.3</td>
<td>4.7</td>
</tr>
<tr>
<td>Computer (&amp; Information Technology)</td>
<td>19</td>
<td>80.7</td>
<td>13.7</td>
<td>5.7</td>
</tr>
<tr>
<td>ECE-Computer &amp; Electrical &amp; Computer &amp; Industrial &amp; Manufacturing</td>
<td>22</td>
<td>69.6</td>
<td>27</td>
<td>9.7</td>
</tr>
<tr>
<td>Mechanical</td>
<td>8</td>
<td>34.7</td>
<td>8.7</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>21</td>
<td>117.3</td>
<td>16</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Graduate School</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Engineering (NSEI)</td>
<td>4</td>
<td>N/A</td>
<td>12.3</td>
<td>9.3</td>
</tr>
</tbody>
</table>

Would the Committee note that the numbers, together with the extramural funding of NSEI, show that the NSEI organizational structure has been effective in teaching and research and in graduate degree productivity in nuclear engineering, and that NSEI was also ranked number 1 in faculty scholarly productivity in the nation in 2007 (by Academic Analytics). The rankings are affected by the “denominators,” that is the faculty listed in the unit- the NSEI ranking improved dramatically from 8 (2006) to 1 (2007) as the number of core faculty was respectively shown as decreasing from about 36 to 6 (please see attached AA tables). For the desirable higher rankings, it is essential that all or most of the faculty have high AA FPSI in the discipline, and adding of more such faculty would be always good.

**Committee Response:**
The committee notes the success of NSEI faculty in obtaining extramural funding, a substantial proportion of which has been in graduate student training grants without or with reduced indirect costs and research support. The relative productivity of the NSEI faculty in graduate training is expected from a unit with no undergraduate program. See table provided with the question.

**Question 3 (from Professors Loyalka and Prelas)**
It is stated that, “For several years after the move, nuclear engineering operated somewhat like a department within the College of Engineering, but did not have full department status, perhaps because of the small number of faculty and lack of an undergraduate program.” It should be noted that although we did not have a formal undergraduate program, beginning in 1987, we were funded by the NSF for an Undergraduate Research Experience in the Particulate Systems program (through the Particulate Systems Research Center which has always been closely affiliated with Nuclear Engineering/NSEI). The program was the first of its kind at MU. The successful collaboration included faculty from Nuclear Engineering, Chemical Engineering, Mechanical Engineering, Chemistry and Physics. This NSF funding
was continued annually for nearly ten years, when we concluded that given administrative changes taking place in the College of Engineering, we needed to focus more on the graduate program.

**Committee Response:**
The committee acknowledges the point, but notes that the program ended five years before NSEI was formed. We also note that the undergraduate experience was possible precisely because nuclear engineering faculty were located in the COE at the time.

**Question 4 (from Professors Loyalka and Prelas)**
It is mentioned that the graduate program was formally shifted to the College of Engineering in 1989.

Would the Committee recognize/clarify that even prior to this formal shift, the Nuclear Engineering faculty members were always accorded all the privileges associated with colleagues in the ‘full’ departments in the College of Engineering, such as formal membership on the College of Engineering Policy Committee and service on various College of Engineering committees, including promotion and tenure? In addition, Nuclear Engineering faculty members participated in the elections of College of Engineering representatives to the Faculty Council and were eligible to serve on the Council if elected by their colleagues. It should be noted that faculty in other units, such as Biological Engineering, which is administratively housed in CAFNR, also were and continue to be accorded similar accommodations. Would the Committee clarify that although the formal shift was in 1989, the graduate program had functioned as a *de facto* department in the College of Engineering even prior to this formal shift?

**Committee Response:**
The committee acknowledges that the nuclear sciences faculty members individually had full faculty status in the COE although they served within an interdisciplinary graduate program. We also emphasize that these faculty members never comprised a regular academic department. Although in some respects the program may have been treated similarly to a department, whatever privileges were afforded nuclear sciences faculty members in terms of *de facto* department status were conferred at the discretion of the COE dean and other relevant administrators.

**Question 5 (from Professors Loyalka and Prelas)**
The History section states, “Lack of department status and confusion associated with that status may have contributed to the tension evident in subsequent years.” We would note that there is little evidence that this was the position of the Nuclear Engineering faculty members, nor were they or any other faculty members in the College of Engineering confused by the status. Might it be clarified that this confusion was created by the COE administration after 1996 as it froze the faculty hiring in nuclear engineering and initiated other adverse actions towards the unit.

**Committee Response:**
The committee notes that in question 4 the nuclear sciences faculty considered the program a “*de facto* department” although they formally served within an interdisciplinary graduate program.

**Question 6 (from Professors Loyalka and Prelas)**
It is stated, “The review team recommended that the Nuclear Sciences faculty be incorporated into existing departments.” It should be clarified that the review team actually recommended consideration of three options, and the one cited above was just one of those three options. May it also be clarified
that the review might have been affected by a lack of transmission of the program self-study by the Provost’s office to the review team, and other issues? These are important matters in the NSEI history.

**Committee Response:**
Two of the three options in the report recommend incorporating the faculty into an existing department(s), the third option is to develop an undergraduate degree program. The latter option presumably precludes housing NSEI in the Graduate School.

**Question 7** (from Professors Loyalka and Prelas)
It is stated, “The Institute received center grant funding, and was expected to be self-funded and subject to review after five years.”
Could it be clarified that funding was received from a competitive Department of Energy INIE grant (2003-2008), one of 5 in the nation, worth several million dollars, and that it benefitted several constituencies in addition to NSEI (MURR, Physics, Chemistry, MST, UMKC, PUPR, [Polytechnic University of Puerto Rico] etc.). We were particularly responsible for bringing in UMKC and PUPR- a minority institution- as collaborative partners.

**Committee Response:**
So noted.

**Question 8** (from Professors Loyalka and Prelas)
It is stated, “These years witnessed declining state support for the University and increasing pressure for NSEI to become self-supporting. There is a question about exactly what selfsupporting meant. In general, revenue is obtained through indirect costs from grants and from tuition.”
It should be clarified that MU provides GO support to many research centers totaling about $15-19 M/year. These centers are not involved with granting of degrees per se. The Centers or Colleges do not receive the indirect monies their grants/contracts generate except partially (25%) through RIF. Also, NSEI has never received these monies except through RIF (50% from 2003-2007, and 25% thereafter). At MU the GO funds derive from mingling of state allocations, fees and tuition and indirect cost recoveries, and thus the concept of “selfsupporting” is confusing and almost meaningless unless one to one correspondence is established in sources of income and allocations, and the “mingling” is eliminated.

**Committee Response:**
The committee notes that the November 4, 2002 letter from Chancellor Wallace to Professor Volkert establishing NSEI requires the Institute to be self-supporting, “Per all of our early discussions, the future of the NSEI depends on its capacity to become self-supporting. For that reason, I am approving the establishment of the Institute on a provisional three year basis. The requirement for continuation of the NSEI beyond the initial three year period is its ability to fully support all of Institute operational expenses through a combination of extramural or self-generated funds and the rate dollars transferred to the Institute directly from the College of Engineering. As we discussed, and particularly in light of our current very challenging budgetary circumstances, the expectation is that no additional cost or rate dollars will be provided to the Institute past the initial three year start-up period. If the Institute is not financially viable at the end of that period, it will be disbanded not later than the point at which the normal five year center review would occur.” Opportunities for generation of GO funds are clear, as is the allocation to NSEI. It is for the administration to determine if those meet the definition of self-supporting.

**Question 9** (from Professors Loyalka and Prelas)
It is stated, “In 2006, UM President Elson Floyd requested that Chancellor Deaton initiate discussions with UMR to consider a possible merger of nuclear engineering programs between the two campuses.” It should be clarified that in 2006 Provost Foster initiated a review of NSEI through an internal administrative committee without the knowledge of any NSEI faculty, and when they became aware of this review, the NSEI faculty expressed concerns and contacted the Faculty Council. The President’s action led to cessation of this review. In response to the President’s request, Chancellor Deaton appointed a team of about 10 faculty members that included only two fulltime NSEI resident faculty, and he appointed Professor David Robertson of Chemistry as a Co-Chair (from the MU side). The three other full-time NSEI resident faculty requested appointment to this committee, however none were appointed. The Committee was not called to meet after its first introductory meeting in Rolla, and the members were not informed of any activity, report or actions initiated by the two co-chairs. There was no action taken at the first meeting, except expectations that the Committee would meet later.

Committee Response:
So noted.

Question 10 (from Professors Loyalka and Prelas)
Lack of Appointment of Director since 2005 May the Committee comment regarding the non-appointment of a Director (even an interim one) after 2005? Would it clarify that, in the Director Search that failed, the Search Committee was chaired by Professor David Robertson (with only two full-time resident NSEI faculty as members of the 10 person Committee)? Would it also clarify that subsequent to this Graduate Dean Benoit offered the position to a non full-time NSEI resident faculty member (we understand personnel issues may preclude naming of names) who according to her notes, “the nukes hated already.” Could it also be noted that the demands of this faculty member for resources, etc. could not be met, and that Dean Benoit did not offer the job to anyone else, including one individual that was strongly supported by the full-time resident faculty (the “nukes”).

Committee Response:
It seems clear to the committee that the administrative structure, animosity, and a variety of other factors precluded naming a director.

Question 11 (from Professors Loyalka and Prelas)
It is stated, “None of the individuals recommended by NSEI as potential reviewers were included in the review team, as members of the administration viewed the recommended individuals, at least some of whom were former students or collaborators, as too closely associated with members of the Institute to provide an objective review.” Professor Mark Prelas submitted about eight names with concurrence of other faculty members (in an email), and none of those proposed had any affiliations of the type mentioned that was previously used to justify the lack of inclusion of NSEI faculty. On the other hand, it is clear that at least one of the reviewers had been proposed by Professor David Robertson. Could this be reviewed and clarified?

Committee Response:
So noted. The committee also notes that Professor Prelas approved the final list of reviewers, “The NSEI review committee looks pretty good.” in a February 4, 2010 email to Dean Justice.

Question 12 (from Professors Loyalka and Prelas)
It is stated that “The findings of the 2010 review were similar to those of the 2002 review. May it be clarified that the review team found all core faculty to be “extremely productive” (not just certain core faculty)? Also, although five possible approaches were suggested, the committee made a set of preferred recommendations. May the Committee clarify that Professors Robertson, Gahl and Jurisson did not share their comments with the NSEI faculty, and they commented on “retirement ages” of full-time resident NSEI faculty as part of the justification for their perspective stating that, “With three of the five faculty at or beyond retirement age.” May anyone at the University clarify what is the retirement age at the University and what is considered beyond it, and why such a letter would be taken seriously by the administration or anyone, particularly when three of the five faculty members referred to were younger than 57 at that time? Would the Committee also clarify that the full-time core NSEI faculty had provided a response to the reviewer comments, and that the review committee or the administration did not respond to, or apparently even consider, this response.

Committee Response:
The committee wishes to clarify that the five approaches referred to in the History were those presented in pages 12 and 13 of the 2010 review. The review committee states, “They are not, repeat not, included here in any rank order.” The review committee did list a set of recommendations on pages 14 and 15 of the 2010 review, but those did not deal directly with the administrative structure, but rather with process (developing a strategic plan, establishing an advisory committee, hiring a leader, gaining ABET accreditation).

Question 13 (from Professors Loyalka and Prelas)
It is stated that, “After the review and in response to calls for increased administrative efficiency, Graduate Dean Justice initiated discussions concerning reorganization of the Graduate School.” May it be clarified that there is no evidence that Graduate Dean Justice or the Provost discussed the review or the actions with the NSEI faculty prior to the actions taken in March 2012? May it be clarified that the nature of how these actions developed is revealed in a series of email exchanges among the administrators over the period October 2010 to March 2012, and that there was an intentional lid placed on the planned actions until March 2012 (these emails are a matter of public record at this point.) Actions such as these are especially troubling as they clearly demonstrate that while the faculty had worked on obtaining Medical Physics accreditation and submitting research/training proposals that committed NSEI/MU to certain activities with administrative approval, decisions had already been made regarding the dismantling of NSEI and were just waiting to be implemented.

Committee Response:
So noted.

Question 14 (from Professors Loyalka and Prelas)
It is stated, “In 2011, the Medical Physics emphasis area of the Nuclear Engineering Graduate Program received accreditation under the leadership of Dr. Evan Boote.”
It may be noted that the situation regarding the Medical Physics emphasis area is more complex than described. Although Dr. Evan Boote was officially appointed as director of the program (and provided both credibility and support), the accreditation effort was primarily led by Professor Tushar Ghosh. He and other full-time resident faculty used their discretionary as well as training grant funds to provide support to graduate students, and to the program. The university (through the medical school dean) promised two tenure track positions. The actions of March12, 2012 were to shutdown NSEI in three
days (without any consultation with the faculty, the medical school dean or CAMPEP), and subsequently in the summer/fall 2012 the admissions in NSEI were shutdown (beginning winter 2013) introducing much uncertainty. Around this time, it was made known that the two positions promised to CAMPEP were not to be filled, and also Dr. Boote’s position was not to be filled after he left the university. There have been disagreements among faculty/administration about withholding of faculty discretionary funds by the administration (a situation not yet resolved, and that continues to place some current MP students at financial disadvantage as the faculty members are limited in their ability to provide some needed financial support). NSEI was required to file only one single report to CAMPEP by May 31, 2013 (no “reports”) concerning progress in 2012, and the report that was submitted by NSEI noted data and some facts regarding the actions and uncertainties. Subsequent clarifications to CAMPEP by the Graduate Dean, in which the NSEI faculty have fully participated, have led to extension of the accreditation for two years (until the end of 2015) so that the current students (mostly PhDs) can graduate to the extent possible under the accredited program. CAMPEP has asked MU not to admit new students during this time. The entire accreditation process will need to be replayed for re-accreditation beyond 2015, and there remain concerns that all current PhD students would in fact be able to complete their PhDs by the end of 2015. It should be clarified that currently, the courses in medical physics are being taught by MU, Washington University and Texas A&M faculty, and the A&M faculty are not teaching the majority of courses (they are teaching only half of a course, out of two). Currently about six of our MP alumni are employed in various capacities at A&M, and this is a very valuable association that serves MU well in a situation where the needs of our MP students and our commitments to them cannot be met otherwise.

Committee Response:
The committee acknowledges that the situation is complicated and concurs that the accreditation of the Medical Physics emphasis area in the Nuclear Engineering Graduate Program is in jeopardy.

Question 15 (from Professors Loyalka and Prelas)
We agree with the committee that as of today there are a number of unresolved issues. We believe that as more and more of the ‘behind the scenes’ documents and communications surfaced and became available to the committee as well as to the NSEI faculty and interested parties, it is crucial that the committee’s report should reflect these circumstances in some manner. We agree that the conflict has persisted too long. It has affected the well-being of our students, staff and faculty, and it has damaged the University’s reputation. We look forward to its resolution in a framework of honesty and integrity. As stated at the beginning of this document, we greatly appreciate the Committee’s efforts and time in delineating a difficult set of events.

Committee Response:
So noted.

Question 16 (from Professor Piper, Department of English)
Losing the accredited Medical Physics program seems like a hit to MU, especially given the work that must go into getting accredited and the connections with Wash U. Why didn't administration do more to ensure this would not happen? (For instance, by replacing Dr. Boote.)

Committee Response:
Issues in the administration of Radiology, events unrelated to NSEI and Medical Physics, complicated the administration’s ability to respond to the Medical Physics accreditation issue.
Question 17 (from Professor Piper, Department of English)
Moving NSEI as a unit sounds like a logical compromise. It does not have to be a "four person" unit and could be open to others— but administered by the specialists in the field. It sounds like the U is bleeding grant money and reputation while the problem goes on and on. Someone clearly has to work with NSEI faculty to resolve the situation. If administration can go over the heads of NSEI to make structural changes, it seems they could go over the heads of Engineering. Why don't they? And why was Thompson opposed to such a solution?

Committee Response:
The committee is not in a position to respond specifically to this question; however, the administration must operate within the limits specified in the Collected Rules.

Question 18 (from Professor Roberts, Chair of Faculty Council)
How should Faculty Council deal with this (or should we not deal with it)? The reason for asking, many former and present members of FC have the view that Council has been used as a lopsided grievance panel.

Committee Response:
The committee interprets “this” to mean the NSEI administrative issue. More faculty members than just those of NSEI faculty are affected in this issue. The Faculty Council must represent the interests of all those involved; where appropriate, individual grievances should be directed to the regular grievance process.

Question 19 (from Professor Roberts, Chair of Faculty Council)
The faculty are being told that administrators violate CRR in their dealings with the nuclear science faculty. From what you have learned, is it clear that administrators violate or have violated CRR?

Committee Response:
Although there may have been administrative mishandling in the history of nuclear sciences, we saw no evidence of violation of the CRR in the events since 2010.

Question 20 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that good people, good productivity, and good recruiting were either lost or never manifested because of improper handling of the NSEI?

Committee Response:
In retrospect, it seems clear that the creation of NSEI as an administrative unit outside of the College of Engineering was not an optimal solutions and has had negative implications for campus research in the nuclear sciences and engineering.

Question 21 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that the NSEI conflict was/is substantially personal between Dean on one side and the NSEI faculty on the other side?

Committee Response:
It is the opinion of the committee that the conflict emerged due to administrative and budgetary decisions made by Dean Thompson in the early years of his tenure at MU. In particular, these owe to his budgetary decision to reallocate College of Engineering resources from centers and other research units in the College of Engineering to the academic departments.
Question 22 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that in the end the upper administration basically took one side (that of the Dean) in and immediately before March of 2012?

Committee Response:
It is unclear to which dean this question refers. If the question refers to the Dean of the Graduate School, then the answer is “yes”. Since 2002, the NESI faculty have reported to the Dean of the Graduate School (Ortega, Benoit, Justice, Rubin), and in conflicts between the Graduate School Dean and NESI, the administration has supported the Graduate School Dean as would be expected because the Graduate School Dean reports to the Provost, and implements Provost policy with respect to NESI. The committee found little evidence of direct line of authority or contact between the College of Engineering Dean and NESI in approximately a decade.

Question 23 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that in taking the side of the Dean, the administration chose politics as an approach rather than a dedication to what was/is best for the University and College?

Committee Response:
Again, it is unclear to which dean this question refers. A consistent theme in all reviews of NESI and nuclear sciences and engineering argue that the current administrative arrangement – the status quo – is detrimental to the advancement of these disciplines at MU.

Question 24 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that because the upper administration was political that the NEP solution may be far less than optimal?

Committee Response:
It seems clear based on the results of external reviews that NESI was a less than optimal solution, although it may have seemed so at the time of its formation. While it is beyond the charge of the committee to assess whether the NEP solution is “optimal”, its creation represents an effort to engage a group of faculty in nuclear engineering teaching and research outside the four NESI faculty members.

Question 25 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that the Faculty (at University level) failed to do an adequate job of Faculty Governance to pursue a solution to the NESI/NEP issue that is BEST FOR THE UNIVERSITY?

Committee Response:
The committee is confident that members and leadership of the Faculty Council used and continues to use their best judgment in pursuit of a solution to the NESI/NEP issue that is best for the University. It is a very complicated issue that affects a broad range of faculty members and the exact role of the Faculty Council isn’t always clear.

Question 26 (from Professor Suppes, Department of Chemical Engineering)
Yes or no, is it more believable than not that it is not too late for Faculty Governance to take an initiative to reorganize NEP/NSEI in a manner that would result in a stronger and better program than the current NEP?

**Committee Response:**
The committee is hopeful that an administrative structure can be achieved in a framework of honesty and integrity which will best serve the well-being of students, staff and faculty in the nuclear sciences. Given the mandates identified in the reorganization of the Graduate School and in Chancellor Deaton’s letter of January 30, 2013, it is not clear what role Faculty Council may have. See also the committee’s responses to questions 16 and 17.

**Question 27 (from Professor Suppes, Department of Chemical Engineering)**
Does the Faculty Council plan to continue to fail to do its job and what is needed on Faculty Governance and on maintaining rigor and professionalism on the exercising of Faculty Authority?

**Committee Response:**
The committee is confident that the Faculty Council will continue to fulfill its role in faculty governance with rigor and professionalism.

**Question 28 (from Latricia Vaughn, NSEI Office Support Assistant)**
In paragraph 4, it is stated that NSEI offers degrees “in a relatively narrow band of nuclear engineering.” How can all of the MS & PhD degrees in Health Physics, Nuclear Power, & the accredited Medical Physics degrees be considered a ‘narrow band’? Minors are offered in nuclear engineering, health physics, & medical physics. Undergraduate Certificates are also offered in Nuclear Engineering. Please clarify for me.

**Committee Response:**
Please see the committee’s response to Question 1.

**Question 29 (from Latricia Vaughn, NSEI Office Support Assistant)**
Also in paragraph 4, how is NSEI “limited by its current organizational structure,” when it has worked with, or currently works with the MURR, professors in radiology, the VA, physics, chemical engineering, Chemistry, Mechanical Engineering, UMR, Vet Med, Washington University (before the accreditation), and the University of Urbana in Champaign, Illinois? Please explain for me.

**Committee Response:**
Again, please see the committee’s response to Question 1.

**Question 30 (from Latricia Vaughn, NSEI Office Support Assistant)**
In paragraph 5, it is stated that “dept. status confusion associated with that status (of being in the grad school) may have contributed” to subsequent tension. I have been working in the NE Program/NSEI for 17.5 years, & have never heard any mention of confusion discussed among the professors regarding their status or where they are ‘located,’ i.e., grad school or the COE. Would you please clarify?

**Committee Response:**
Please see the committee’s response to Question 5.

**Question 31 (from Latricia Vaughn, NSEI Office Support Assistant)**
In par. 7, it is stated that “productivity was centered on a few individuals, some of whom have since left MU.” Who are those individuals? I was here, & to my knowledge, we only had one adjunct professor move out of state during that time from NE. The second review committee actually stated, “The five current faculty members in NSEI are extremely productive in teaching 2-4 courses per faculty per year” with “externally funded research...in the range of $2-4M per year...” through “approximately 55 graduate students “ THe statement above appears contradictory. Could the committee give details on that?

Committee Response:
The individuals cited were the core nuclear engineering faculty, some of whom the committee believes have retired. The History states, “The findings of the 2010 review were similar to those of the 2002 review. The team identified many positives in the program, including the productivity of certain core members of the Institute.” The committee does not find these statements to be contradictory.

Question 32 (from Latricia Vaughn, NSEI Office Support Assistant)
Regarding the “few individuals” working with NSEI, I am puzzled why it says there were only a few, when faculty from the VA, Radiology, Vet Med, physics, chemistry & the MURR were all working with the NE core faculty. I am confused regarding this statement. Are all those faculty considered ‘few?’

Committee Response:
The committee believes that the history is misinterpreted in this question. The only reference to a “few individuals” in the History refers to a statement in the 1999 review, before the formation of NSEI, citing productivity of core nuclear engineering faculty, not collaborators. The reference highlights the productivity of those individuals, but emphasizes the small number of individuals in that core.

Question 33 (from Latricia Vaughn, NSEI Office Support Assistant)
On page 5, there is a list of suggestions to remedy the perceived inability (for NSEI) to reach the campus’ potential. The Committee actually recommended,

- there is an immediate need to complete a specific NSEI and/or nuclear science & Engineering enterprise-wide strategic plan within the next 6-12 months.
- will require professional strategic planning assistance
- to reach an outcome that is deployable
- it is imperative that the University hire a strong leader to work with the university administration & the existing core & adjunct faculty
- the cloud of uncertainty surrounding NSEI...must be removed before a new leader can be attracted.

Please explain why none of these suggestions were in the report.

Committee Response:
Please see the committee’s response to Question 12. In the committee’s view, the recommendations cited in the question did not deal specifically with the administrative structure of NSEI, but rather with process.

Question 34 (from Professor Wakefield, School of Medicine)
It would be very helpful if the committee would identify and make available those “major” reports, evaluations, or other documents that were found to be most helpful.
Committee Response:
While the committee does not “own” the documents, Professor Roberts has forwarded a request to the General Counsel asking permission for a core set of documents, identified by the committee, to be stored in the Faculty Council office in Conley House and to be made available to Faculty Council members.
A Brief History of Nuclear Sciences at the University of Missouri

January 23, 2014

Process

The document was compiled by Jay Dow, Professor of Political Science, Paul Ladehoff, Director of the LL.M. in Dispute Resolution program, Bill Wiebold, Professor of Plant Sciences, and Bill Lamberson, Professor of Animal Sciences (chair). The committee was appointed by Craig Roberts, Chair of Faculty Council, on September 18, 2013, and given the charge to develop a succinct history of the administrative structure affecting the Nuclear Sciences Engineering Institute (NSEI) beginning with its move from the College of Engineering to the Graduate School, including timelines, program reviews, proposals for moving back to an academic department, and the current status. Membership of the committee was endorsed by the Chancellor, the Dean of Engineering, and the NSEI faculty (hereafter, the principals).

The committee compiled the History by reviewing an archive of documents held in the Graduate School, with supplemental information provided by the Office of the Chancellor, the Dean of Engineering, and NSEI faculty. The committee reviewed documents including, but not limited to, previous histories, reviews, meeting minutes and correspondence totaling more than 1500 pages. The principals were given access to all documents and given the opportunity to suggest names of individuals to be interviewed by the committee. The committee formally interviewed twelve individuals and had less formal conversations with others. A few individuals declined to be interviewed. Many of the incidents that influenced the course of events happened 10 or more years ago. Certainly, not all individuals interviewed, even the principals, had complete knowledge of all aspects of the picture, and memories fade over time. In exercising this responsibility, we recognize that many MU faculty beyond those currently residing in NSEI are affected by the organizational structure of nuclear sciences and engineering. The committee has done its best to piece together as accurate representation of events as possible.

Executive Summary

Nuclear engineering and sciences enjoy a distinguished history at the University of Missouri. Nuclear engineering and sciences developed in the College of Engineering, Department of Chemical Engineering, and gained momentum in the mid 1960’s with the construction of the University of Missouri Research Reactor. From that time, degree programs and the tenure homes of affiliated faculty have moved between the Graduate School and the College of Engineering. Prior to the late 1980’s, Nuclear Engineering was housed in the Graduate School. From 1989 to 2002 Nuclear Engineering resided in the College of Engineering. In 2003 NSEI was created as a unit within the Graduate School. This fluidity in program and faculty location partially reflects a campus tension over whether MU should focus on nuclear engineering or on the nuclear sciences more broadly. This tension raises two questions that
shape the current controversy over the administrative organization of NSEI. The first centers on where degree programs are housed. The second is where the tenure homes of faculty reside. Graduate degree programs are generally housed in departments or colleges, or sometimes in the Graduate School. It is unusual for faculty to have tenure homes in an institute, as most faculty’s tenure is in a department in a school or college. NSEI is the only MU campus example of a graduate degree-granting program with its core faculty holding tenure in the Graduate School.

The question of where nuclear engineering and its faculty properly belong drives the current discussion surrounding NSEI. Faculty stakeholders in this discussion are located in NSEI and in other campus units and differences over the proper organization of nuclear engineering and sciences are as much disputes among faculty as they are a dispute between faculty and administrators. The evidence is that NSEI properly trains graduate students, albeit in a relatively narrow band of nuclear engineering. However, the campus and College of Engineering teaching and research profiles in nuclear engineering and sciences may be limited by the current organizational structure.

History (see timetable, page 7)

Events leading to development of the Nuclear Sciences Engineering Institute (1966 – 2003)

The modern era of nuclear sciences at the University of Missouri began with nuclear sciences as a subunit of the Department of Chemical Engineering in the 1960’s. Nuclear sciences at MU was significantly advanced by the development of the MU Research Reactor, which became operational in 1966. At about that same time, a graduate program in Nuclear Engineering was established in the Graduate School. The graduate program complemented an undergraduate program in Nuclear Engineering that was initiated at the University of Missouri – Rolla. The MU graduate program was unusual in that faculty members evidently had the program in the Graduate School as an academic home, yet they were jointly administered by the Graduate School and College of Engineering, and issues such as salary decisions were determined by the Dean of Engineering. In 1989, the graduate program was shifted to the College of Engineering under Dean Tony Hines. The tenure homes of the nuclear engineering faculty were transferred from the Graduate School to the College of Engineering, and all subsequent faculty appointments were made through the College of Engineering. This was evidently a seamless transition, as current NSEI faculty members were not aware of any changes associated with it. For several years after the move, nuclear engineering operated somewhat like a department within the College of Engineering, but did not have full department status, perhaps because of the small number of faculty and lack of an undergraduate program. Lack of department status and confusion associated with that status may have contributed to the tension evident in subsequent years.

In 1994, Dean Hines was succeeded by Dean James Thompson. Dean Thompson was charged by campus administrators with increasing the level of research activity in the College. One result from the increased emphasis on research was a shifting of resources from centers to departments within the College. There was a perception by members of the College of Engineering faculty of a lack of transparency in administrative decisions. A number of faculty members across the College, including at least two
members of Nuclear Sciences, signed a letter expressing concern regarding the administrative approach and the letter was submitted to the Dean. Concurrent with this event, two ongoing faculty searches within Nuclear Sciences were suspended. The committee was unable to determine the reason that the searches were suspended, but the coincidence in timing with the letter from faculty to the Dean increased distrust of the College administration. From 1996 to 1998, Nuclear Sciences faculty members filed approximately 13 grievances with members of the Engineering administration named as respondent. The nuclear engineering faculty had standing to file these grievances because they were faculty in the College of Engineering. The general topics of these grievances were compensation, hiring decisions, and equipment. There were mixed results of the grievance process, with panels finding in some cases for the grievant and in others for the respondent.

Chancellor Wallace initiated an effort at mediation in 1996, but that effort failed. There was a general escalation of conflict and Dean Thompson, without informing the Nuclear Sciences faculty, sought input from an external advisory group. This caused concern because of a misperception that it was part of a regular external review, which was conducted at nearly the same time. Nuclear Sciences faculty expressed concern about the external review, as they were given only a few days to suggest potential review team members. The review was conducted in 1999 and produced mixed results. The reviewers commented on the strengths and productivity of the individual faculty, but noted that most of the productivity was centered on a few individuals, some of whom have since left MU. Review team members identified an opportunity for a broad-based program with contributions from Radiology, the Reactor, Chemistry, Physics, Chemical and Mechanical Engineering in conjunction with the core Nuclear Engineering faculty; however, it was clear that this potential was not being realized. The review team recommended that the Nuclear Sciences faculty be incorporated into existing departments in the College of Engineering, and Dean Thompson favored that change. The Chair of Mechanical Engineering invited the Nuclear Sciences faculty to join the Mechanical Engineering Department, but there was no resolution to the issues already dividing the Nuclear Sciences faculty from the College of Engineering, and Nuclear Sciences faculty rejected the invitation.

Creation and Review of the Nuclear Sciences Engineering Institute (2003 to 2010)

Provost Deaton favored Dean Thompson’s proposal to move the Nuclear Sciences faculty into Engineering departments, but Nuclear Sciences faculty adamantly opposed that option. Vice-Chancellor for Research Jack Burns proposed an alternative plan to create a Nuclear Sciences Institute within the Graduate School in conjunction with an opportunity to compete for a center grant. In 2003, Chancellor Wallace approved creation of the Nuclear Sciences Engineering Institute (NSEI) on a trial basis with Professor Wynn Volkert as Interim Director. The Institute consisted of five core faculty members and several associated faculty members from across the University. At this time the tenure homes of the core faculty were transferred to NSEI within the Graduate School. The Institute received center grant funding, and was expected to be self-funded and subject to review after five years. According the Chancellor Wallace’s memorandum, the continuing status of NSEI was clearly dependent on results of a
formal review. Both faculty and administration expressed optimism with respect to increased activity and collaboration in nuclear sciences and engineering.

Dr. Suzanne Ortega was Dean of the Graduate School when NSEI was created and she initially had administrative responsibilities for the Institute. She was succeeded by Dean Pam Benoit. The Institute Interim Director (Volkert) retired in 2006 and a search for a replacement was unsuccessful. Despite the leadership transition, in some respects this was a relatively quiet and productive period. These years witnessed declining state support for the University and increasing pressure for NSEI to become self-supporting. There is a question about exactly what self-supporting meant. Does it mean generating revenue to offset General Operating dollars currently provided for salary lines (~ $840K per year), or just support beyond the salary lines provided by General Operating funds? In general, revenue is obtained through indirect costs from grants and from tuition. NSEI has only limited ability to generate tuition revenue because there is no undergraduate program and graduate tuition is usually offset by fee waivers. Although NSEI faculty members are effective at attracting grants, a substantial share of this funding is in training grants which has sustained a large graduate program, but provide little if any salary offset or indirect cost funds. In 2008, the 0.50 FTE salary support recovered from the retired Director position was used for salary increases and to meet GO budget cuts.

Although successful in some instances, the anticipated synergy of collaboration was not realized. Internal differences between the core NSEI faculty and affiliated faculty partially contributed to a gradual decline in collaboration between NSEI and other faculty engaged in nuclear engineering and sciences. During this period, the core NSEI faculty changed their by-laws to effectively put control of the Institute in the hands of its full time, resident, faculty. These by-laws are “department like” in that they contain processes for governance, tenure and promotion, and related considerations. Consequently, affiliated faculty were further removed from the day-to-day operations of the unit. While NSEI faculty have occasionally reached out to university faculty, there has not been the expected reciprocation.

In 2006, UM President Elson Floyd requested that Chancellor Deaton initiate discussions with UMR to consider a possible merger of nuclear engineering programs between the two campuses. A broad-based committee was appointed, but discussions broke down after a single meeting of the committee.

University administration made plans for the mandated review of the program in 2008. With the departure of Dean Benoit, the review was delayed until 2010 and new Graduate Dean George Justice took over administration of the Institute. There was once again controversy over the makeup of the review team. None of the individuals recommended by NSEI as potential reviewers were included in the review team, as members of the administration viewed the recommended individuals, at least some of whom were former students or collaborators, as too closely associated with members of the Institute to provide an objective review.

The findings of the 2010 review were similar to those of the 2002 review. The team identified many positives in the program, including the productivity of certain core members of the Institute. However, as in 2002, the reviewers concluded that the broader nuclear sciences program at MU was not achieving its potential. This inability to reach the campus’ potential in nuclear engineering and sciences was driven
in part by the isolation of the core faculty. Five approaches were suggested in no order of preference as possible ways to move NSEI forward:

1) Continue the program as it currently is, with no replacement of faculty, for as long as the faculty members are judged to be collectively successful. Conduct reviews at three year intervals.

2) Return to the 2002 vision and invite all campus faculty members with interest in nuclear sciences to renew their relationship with NSEI. Add three faculty lines and recruit a new leader from outside.

3) Relocate NSEI as a department into a college, recruit a new leader from outside, and add a minimum of five new lines.

4) Move current faculty members and academic programs to new academic homes, reorganize NSEI as a research institute within the Office of Research, and invite faculty members with interest in nuclear sciences to re-engage their relationships with NSEI. There would be no faculty members with tenure homes in NSEI and no academic programs within NSEI.

5) Move individual NSEI faculty members to new academic homes and terminate or relocate academic programs to existing academic units.

Professors Robertson, Gahl, and Jurisson commented on the report. They recommended Option 4 as the only viable alternative given the value of nuclear sciences to the campus and the fiscal constraints on the University.

Reorganization of the Graduate School (2011 to 2013)

After the review and in response to calls for increased administrative efficiency, Graduate Dean Justice initiated discussions concerning reorganization of the Graduate School. All faculty members with tenure homes in the Graduate School (Truman School and NSEI) would be transferred to other academic homes.

In 2011, the Medical Physics emphasis area of the Nuclear Engineering Graduate Program received accreditation under the leadership of Dr. Evan Boote. This is a collaborative program with the Washington University (St. Louis) Department of Radiation Oncology. Dr. Boote has since left MU. A major portion of the specialty courses offered by MU in this emphasis area have been taught by an adjunct faculty member from Texas A&M via distance learning. Failure to file high quality annual reports has raised questions regarding the continued accreditation of the emphasis area. Admissions to the Medical Physics program are currently suspended, and there are no immediate plans to replace Dr. Boote’s position.
In March 2012 Provost Foster and Dean Justice announced plans for reorganization of the Graduate School. The NSEI administrative structure was to be dissolved. The graduate program was to be maintained until current students completed their degrees, but no new admissions to the Graduate School’s graduate program in Nuclear Engineering would occur as of Fall, 2013. NSEI faculty members have been given until July 1, 2014 to find new tenure homes. Concurrently, a group of faculty members with interest in nuclear sciences and nuclear engineering (NEP) under the leadership of Professors John Gahl and Naz Islam proposed a new interdisciplinary graduate program in Nuclear Sciences and Engineering. The program, administered through the College of Engineering, was approved by the Graduate Faculty Senate. NSEI faculty have questioned the legitimacy of new graduate program and called for the dissolution of the Graduate Faculty Senate. As of 1/30/2013 the new Nuclear Engineering Program was the only nuclear engineering program authorized to admit students.

In an April 2012 meeting of campus administrators, College of Engineering administrators, and NSEI faculty, three ideas were proposed for relocation of the NSEI faculty:

1) move NSEI into Engineering as a unit;

2) move NSEI faculty members as individuals into Engineering departments; and

3) move NSEI faculty as a unit into an existing department in Engineering.

Over a period of weeks, Dean Thompson rejected the idea of NSEI faculty forming a four-person department. Professors Loyalka and Prelas reject the proposal to move NSEI faculty members as individuals into departments in Engineering. Professor Loyalka rejected the proposal of moving the NSEI, with partial autonomy, into Mechanical Engineering, citing past conflicts.

Current status

As of this writing (January 2014), there are a number of unresolved issues. The NSEI faculty remain in the Graduate School and face a mandate of identifying alternative tenure homes by July 1, 2014. Accompanying that transition will be the transfer of fiscal administrative responsibilities. The NSEI faculty members have thus far been unwilling to accept students through the NEP, thus funding for students provided by training grants is not being used.

This conflict has now existed for nearly 20 years despite the good intentions of nearly everyone involved to promote a productive program in nuclear sciences and engineering. The cost to the institution has been enormous in lost productivity as well as in tarnished reputation through the many negative news articles that it has engendered. Although individual members of the faculty active in nuclear sciences, particularly NSEI faculty, have been individually productive, there has also been an opportunity cost of lost collaboration among the faculty members. This conflict has been largely understood as a dispute between faculty and administration centered on differing visions of nuclear engineering and sciences, with one vision espoused and articulated by the NSEI faculty and another by the administration. This is part of the conflict, but to the extent this is the case, the administration is also articulating views that
are held by other faculty stakeholders. The dispute is conflated as administration versus NSEI faculty, when much of the contention surrounding the organization of nuclear sciences and engineering resides in differences among faculty as to how to best advance research and teaching in nuclear engineering and nuclear sciences. Some of the interests that must be balanced in this dispute are those of the NSEI faculty and relevant faculty in the College of Engineering and other academic units. The members of this committee hope that with the reorganization of the Graduate School and turnover of University administration, this costly and often bitter dispute can be resolved and put behind us.

Acknowledgements

We appreciate the excellent cooperation of the NSEI faculty, University administration, the administration of the College of Engineering, and other members of the faculty, particularly past chairs of Faculty Council. We acknowledge staff support of Faculty Council secretary Rebekah Hart, and Animal Sciences staff members Angie Gallatin, Cinda Hudlow, and Cyndi Jennings in supporting this review.