

Center for Interdisciplinary Research and Graduate Education

Motions to be Presented at the October 18, 2010 Meeting of the Faculty Senate

Doug Birdwell / Professor / EECS
October 15, 2010 (version 3)

These motions are copies of those within the appended document and are provided below for convenience. I will introduce the first motion after the motion to accept the minutes of the Graduate Council Meeting of September 23, 2010 is on the floor:

1. Motion to Divide the Question and consider the acceptance of pages G1637-G1642 as a separate motion.

The following motions will be introduced during either discussion of the minutes of the Graduate Council Meeting (if motion #1 fails) or during discussion of a subsequent motion to accept pages G1637-G1642 of the Graduate Council Minutes:

2. Motion to amend by adding the following language to the motion:

A CIRE Interim Credentials Committee (CIRE/ICC) is to be formed. The CIRE/ICC is to be composed of eight individuals who hold the rank of Professor on the Knoxville campus (UTK/UTIA) or an equivalent rank at ORNL and are appointed by the appropriate Chancellor or the Laboratory Director. Exactly four members of CIRE/ICC shall have a home unit within UTK/UTIA, and the remaining four members shall have a home unit within ORNL. At least one member of the committee must have a home appointment in UTIA. None of these faculty members may hold an administrative appointment within CIRE or to which CIRE reports (including the CIRE Board of Directors).

The function of the CIRE/ICC is to establish interim faculty review procedures and review candidates for appointment to the Faculty of the CIRE and to make recommendations to the UTK Chancellor, UTIA Chancellor, and the ORNL Laboratory Director to appoint or not appoint each candidate. An affirmative vote by at least six (6) members of the CIRE/ICC is required for each appointment. The appropriate Chancellor and Laboratory Director will also receive a recommendation from the CIRE Board of Directors and will make the appointment decision.

The CIRE/ICC will serve in this capacity until all of the following conditions are satisfied:

1. The CIRE Faculty includes at least eight individuals holding an appointment at the rank of Professor in CIRE, with at least four of these individuals having home appointments in each of UTK/UTIA and ORNL.
2. The CIRE Faculty shall have an approved CIRE Bylaws that establish a CIRE Credentials Committee and that governs appointment, promotion, and review processes.
3. The CIRE Faculty shall have elected members of its faculty to serve on the CIRE Credentials Committee.

The following constraints are placed upon the composition of the CIRE Credentials Committee (CIRE/CC) that is to be established by the CIRE Bylaws:

1. CIRE/CC members must be members of the CIRE Faculty.
2. The CIRE/CC must have an even number of members.
3. An affirmative vote by at least 75% of the members of the CIRE/ICC is required for each appointment to the CIRE Faculty.
4. The representation of UTK/UTIA of UTK/UTIA and ORNL on the CIRE/CC must be equal, such representation counted by the home organization of each member on his or her letter of appointment.
5. No member of the CIRE Credentials Committee may hold an administrative appointment within CIRE or to which CIRE reports at either UTK/UTIA or ORNL.

I believe this amendment will be considered **friendly** by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

Rationale: The existing CIRE structure allows the CIRE Board of Directors to decide whom to appoint as CIRE Faculty, and only 3 of 13 people on this board are UTK/UTIA faculty members who do not hold administrative appointments. UTK policies on faculty appointments typically have input from both faculty groups and administrators, and this is also reflected in our promotion and tenure processes. This amendment establishes an independent group equally representative of UTK/UTIA and ORNL of individuals who do not have administrative appointments within the CIRE administrative and reporting structure to review credentials of applicants for CIRE faculty positions.

3. Motion to make the following changes under “Requirements” (from the Graduate Council Minutes, p. G1639):

*A minimum of 72 hours is required beyond the bachelor’s degree, exclusive of credit for an MS thesis, and completion of the core requirements, as outlined in the section on Course Requirements. Of this number, a minimum of 24 ~~and up to 36~~ hours of 600 Doctoral Research and Dissertation and ~~six~~ *nine* hours of 600-level coursework at UTK/UTIA ~~will be~~ *are* required. *Six of the nine hours of 600-level coursework must be offered by an engineering, science, or mathematics department at UTK/UTIA other than ESE.**

I believe this amendment will be considered **friendly** by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

Rationale: The only ESE 600-level coursework available in the new program is a special topics course with undefined content. This amendment requires 6 hours of non-ESE 600-level course credit in established UTK/UTIA PhD degree programs. In addition, there is no need for the limit on 600 Doctoral Research and Dissertation credit if Motion 5 is accepted (also considered friendly).

4. Motion to add the following statement to the paragraph referenced in amendment 3 (from the Graduate Council Minutes, p. G1639):

The coursework must include a minimum of six credit hours of mathematics at the 400-level or higher.

Rationale: Mathematics is the common language of fields of specialization within the Science, Technology, Engineering, and Mathematics (STEM) umbrella. I believe it is important to codify the requirement for a mathematics coursework component. Lee Riedinger believes it is sufficient to leave this to PhD research committees. The proposed ESE PhD Program is being promoted as a premiere degree program, and it is important that it not have requirements less rigorous than existing PhD degree programs that may compete with it for graduate students. Both the Electrical Engineering and the Computer Engineering PhD programs have this mathematics requirement. The requirement should not be overly burdensome since the entering students are expected to have a BS degree in an Engineering or Science field. (See <http://ese.utk.edu/apply.html>.)

5. Motion to make the following changes under “Course Requirements” (from the Graduate Council Minutes, p. G1639):

Out of the 72 hours required for the program, ~~36~~ 48 hours of coursework ~~is~~ *are* required beyond the BS degree. Up to six credit hours can be waived with the consent of the graduate student’s PhD committee and the ESE faculty. Of these, the following 30 hours of coursework or their equivalent must be completed at a minimum, including the Core Curriculum, a Knowledge Breadth Curriculum, a Knowledge Specialization Curriculum, and Seminar Series, as summarized below.

I believe this amendment will be considered **friendly** by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

Rationale: Approval of this motion will increase the credit hours of coursework required from 36 to 48 (post-BS). Without this increase, the proposed ESE PhD degree program can be viewed as an “easy path” to a PhD when compared to other PhD degree programs within the College of Engineering. This increase also implies additional required in-depth training in course materials within the UTK/UTIA established graduate programs, which offsets the number of course credit hours that are devoted to wide-spectrum training with an emphasis upon breadth.

Center for Interdisciplinary Research and Graduate Education

Questions, Concerns, and Possible Solutions

Doug Birdwell / Professor / EECS

October 14, 2010

The questions and concerns I am raising are a result of my review of two documents distributed by Lee Riedinger, the Director of the recently established Center for Interdisciplinary Research and Graduate Education (CIRE):

1. Departmental and faculty opportunities in CIRE, Lee Riedinger, 09/28/2010, available at http://web.utk.edu/~senate/docs/2010-11/FSECAttachment4-A%26S_DH_meeting.pdf.
2. Minutes of the Graduate Council, 09/23/2010, available at <http://gradschool.utk.edu/GraduateCouncil/Minutes/GC%209-23-10%20Minutes.pdf>.

Other documents that I have read are also of interest:

3. Memorandum re “Task Force to create and implement the UTK ORNL Center for Interdisciplinary Research and Graduate Education (CIRE)”, Thomas Mason and Jimmy G. Cheek, 02/16/2010, available at
4. Intent-to-Plan Notification, Interdisciplinary Program in Energy Sciences, Carolyn R. Hodges, 04/21/2010, available at
5. Approval of Letter of Intent to Plan: Ph.D. in Energy Sciences and Engineering by the University of Tennessee Knoxville, Richard Rhoda, 05/19/2010, available at

Documents [3-5], together with a version of the CIRE material in document [2] in a slightly different format, are available in the Curriculum Committee’s report of its August 26, 2010 meeting at <http://gradschool.utk.edu/GraduateCouncil/CurrComm/20100826-CurrComm-Report.pdf>.

A few copies of a 6th document of interest were distributed by Lee Riedinger at the 10/04/2010 meeting of the Faculty Senate Executive Committee but this document does not appear to be available on the web:

6. Proposal for the Initiation of a Doctor of Philosophy of Energy Science and Engineering Program (undated).

The CIRE proposal has some flaws, primarily in degree requirements and expectations and governance, but could have an overall positive impact upon our institution and ORNL. For this to occur, the UT faculty needs to maintain firm control of academic standards and oversight of CIRE governance. In

particular, the requirements for a PhD in a CIRE program must be at least as rigorous as the requirements for a PhD in departments having similar research areas (engineering, science, mathematics).

There is opportunity for CIRE to become a liability because there can be financial incentives to faculty members to process research proposals through CIRE. The reduced overhead rate afforded the resulting research efforts only benefits CIRE, so although UTK/UTIA will provide the formal education (coursework) for these students, the UTK/UTIA infrastructure will have to bear these costs without income from their research.

We have an opportunity to do things well – or poorly. A first step is the formation of the CIRE Faculty, where quality must be paramount. As discussed below, the current mechanisms for appointment of CIRE faculty members are not sufficient to ensure quality. I met with Lee Riedinger and Soren Sorenson (Head, UTK Dept. of Physics) on October 13, 2010 to discuss these issues, and with one exception (as noted below) amendments to the ESE PhD degree program and the structure of CIRE have been formulated that are agreeable to us.

Formation of CIRE Faculty

A bootstrapping process is necessary to create a CIRE Faculty. At the 10/4/2010 meeting of the Faculty Senate Executive Committee, Lee Riedinger told the committee that the current assumption was the CIRE Board of Directors (BoD) would perform this function. As presently constituted the CIRE BoD is not sufficiently representative of the faculty to determine eligibility and approve candidates. This, however, is the way things stand: From [6, p. 12], “Initially the CIRE Board of Directors (appointed by the Chancellor and the Laboratory Director) will serve as the interim Credentials Committee for the purpose of approving the initial CIRE faculty.”

The 2/18/2010 memo from Tom Mason and Jimmy Cheek that created and charged the task force to create and implement CIRE stated: “We also request that a vetting process for some faculty be established and implemented for CIRE with the goal of getting some CIRE faculty in place by September 2010”.

Only 3 of the 13 members of the CIRE Board of Directors are UT faculty members who are not also administrators. Individuals who serve in dual roles do not traditionally vote as faculty members in academic matters such as appointment, promotion, and tenure because of possible conflicts of interest. The Faculty Handbook and the University’s policies and procedures provide for separate paths for administrative input. Faculty interests are severely under-represented on the CIRE Board of Directors, and I

recommend that a separate committee composed only of members of the UT faculty be appointed to vet candidates for the CIRE Faculty.

I will propose the following motion to the Faculty Senate

(Motion 2):

A CIRE Interim Credentials Committee (CIRE/ICC) is to be formed. The CIRE/ICC is to be composed of eight individuals who hold the rank of Professor on the Knoxville campus (UTK/UTIA) or an equivalent rank at ORNL and are appointed by the appropriate Chancellor or the Laboratory Director. Exactly four members of CIRE/ICC shall have a home unit within UTK/UTIA, and the remaining four members shall have a home unit within ORNL. At least one member of the committee must have a home appointment in UTIA. None of these faculty members may hold an administrative appointment within CIRE or to which CIRE reports (including the CIRE Board of Directors).

The function of the CIRE/ICC is to establish interim faculty review procedures and review candidates for appointment to the Faculty of the CIRE and to make recommendations to the UTK Chancellor, UTIA Chancellor, and the ORNL Laboratory Director to appoint or not appoint each candidate. An affirmative vote by at least six (6) members of the CIRE/ICC is required for each appointment. The appropriate Chancellor and Laboratory Director will also receive a recommendation from the CIRE Board of Directors and will make the appointment decision.

The CIRE/ICC will serve in this capacity until all of the following conditions are satisfied:

1. The CIRE Faculty includes at least eight individuals holding an appointment at the rank of Professor in CIRE, with at least four of these individuals having home appointments in each of UTK/UTIA and ORNL.
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The following constraints are placed upon the composition of the CIRE Credentials Committee (CIRE/CC) that is to be established by the CIRE Bylaws:

1. CIRE/CC members must be members of the CIRE Faculty.
2. The CIRE/CC must have an even number of members.

3. An affirmative vote by at least 75% of the members of the CIRE/ICC is required for each appointment to the CIRE Faculty.
4. The representation of UTK/UTIA of UTK/UTIA and ORNL on the CIRE/CC must be equal, such representation counted by the home organization of each member on his or her letter of appointment.
5. No member of the CIRE Credentials Committee may hold an administrative appointment within CIRE or to which CIRE reports at either UTK/UTIA or ORNL.

I believe this amendment will be considered **friendly** by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

I assume that responsibility for approval of candidate CIRE faculty members for direction of PhD research will rest with the Graduate Council. There does not yet appear to be an approved performance review and promotion approval process, and this process needs to be codified within the CIRE Bylaws. The Faculty Handbook (FH) requires input from units other than the home department for all joint and intercampus appointments: "On all matters, the home department should consult with the department head and faculty of the other unit." (section 3.5). The FH requires that the "original appointment letter" must specify the home department, reporting relationships, and peer group(s) to be consulted for promotion and tenure considerations. I recommend that appointments be modified in writing for CIRE faculty members to specify that the home department (at either UT or ORNL) must solicit input from the CIRE Director on all performance reviews and promotion and tenure recommendations.

It appears that modifications to the FH may be necessary to accommodate modifications to appointments and reporting relationships; this should probably be addressed for other cases as well, since a faculty member's relationships with administrative units within UT, and ORNL, may change over time.

Energy Science and Engineering (ESE) PhD Curriculum

The proposed ESE PhD curriculum requires 36 credit hours of coursework, of which 30 are specified in four areas: 6 "core", 6 "breadth", 15 "specialization", and 3 seminars (Graduate Council Minutes, 09/23/2010). Of the 72 hour requirement for the PhD, 24 to 36 hours are required of Doctoral Research and Dissertation (ESE 600), and six hours of 600-level coursework are required at UTK/UTIA. Of the 30 hours of coursework specified in ESE, 21 of these hours ("core" and "specialization") appear to qualify toward a PhD in, for example, an engineering department. My personal opinion is seminar credit should not be allowed to count toward the credit hour requirements for a PhD, but if it is allowed, a 3 credit hour maximum should be imposed. In

addition, it is questionable whether the “breadth” requirement should count. Other specific problems include:

1. There is no requirement for coursework in mathematics.
2. Only 6 hours of 600-level coursework are required (and no such ESE courses have been proposed, other than special topics courses absent any defined content).

For comparison, the PhD program in Electrical Engineering has a 48 hour course requirement (which can be reduced to 39 for exceptional students), and requires 6 credit hours of mathematics and 9 credit hours of 600-level coursework. (see http://catalog.utk.edu/preview_program.php?catoid=2&poid=338). The proposed CIRE / ESE PhD degree program is supposed to be a premier program. The CIRE / ESE PhD degree requirements should at a minimum be as rigorous as those of departments with which its faculty are affiliated and degree programs with which it might compete for students.

I propose the following amendments to this curriculum

(Motion 3):

Under “Requirements” (from the Graduate Council Minutes, [2]), make the following changes:

*A minimum of 72 hours is required beyond the bachelor’s degree, exclusive of credit for an MS thesis, and completion of the core requirements, as outlined in the section on Course Requirements. Of this number, a minimum of 24 ~~and up to 36~~ hours of 600 Doctoral Research and Dissertation and ~~six~~ *nine* hours of 600-level coursework at UTK/UTIA ~~will be~~ *are* required. *Six of the nine hours of 600-level coursework must be offered by an engineering, science, or mathematics department at UTK/UTIA other than ESE.**

I believe this amendment will be considered friendly by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

(Motion 4):

Add the following statement to the paragraph referenced in Amendment 3:

The coursework must include a minimum of six credit hours of mathematics at the 400-level or higher.

This amendment can be discussed and voted upon, if seconded, by the Faculty Senate.

It is my opinion, and I believe this opinion is held by many of my colleagues in the College of Engineering, that mathematics forms the common language that binds the disparate areas within Science, Technology, Engineering, and Mathematics (STEM). The CIRE has been formulated and promoted as a STEM program.

Some UTK departments, including EECS, have this requirement in their PhD programs, while others, such as Physics, require knowledge of mathematics but have no formal requirement and rely upon committees that direct doctoral students' research to impose specific requirements. Some students, such as those with backgrounds in the biological sciences, may enter the ESE program with much less mathematical background and maturity than is expected in engineering or physics, and can be placed at a severe disadvantage in an interdisciplinary program such as ESE without this background.

This amendment imposes a uniform minimum requirement and avoids a possible perception that the proposed curriculum is weaker than existing PhD programs.

(Motion 5):

Under "Course Requirements" [2], make the following changes:

Out of the 72 hours required for the program, ~~36~~ 48 hours of coursework ~~is~~ are required beyond the BS degree. Up to six credit hours can be waived with the consent of the graduate student's PhD committee and the ESE faculty. Of these, the following 30 hours of coursework or their equivalent must be completed at a minimum, including the Core Curriculum, a Knowledge Breadth Curriculum, a Knowledge Specialization Curriculum, and Seminar Series, as summarized below.

I believe this amendment will be considered friendly by Lee Riedinger, who will represent the CIRE Board of Directors at the October, 2010 meeting of the Faculty Senate.

The ESE PhD program requires each student to successfully complete a Qualifying Examination, a Comprehensive Examination, a Dissertation, and a Defense of Dissertation Examination [2,6]. Two issues with the Qualifying Examination and Comprehensive Examination were brought up during discussions after the Faculty Senate Executive Committee, and neither was satisfactorily addressed at that time.

A Qualifying Examination is typically taken by students who are entering a PhD program – often during their first year of study. The purpose of the Qualifying Examination is not stated in the CIRE materials, but it is usually one factor in a determination of whether a student has sufficient background knowledge and capability to perform research in a field of study. Qualifying Examinations need to be administered to a group of students to provide a comparison between students. CISE students will be admitted with highly diversified backgrounds – with undergraduate and possibly master’s degrees from any field of engineering, mathematics, and the physical and biological sciences. One cannot even assume a consistent level of mathematical training. The design of a Qualifying Examination that will provide a fair assessment of all students during the first year of their program of study will be extraordinarily challenging, if not impossible.

An alternative that may be feasible but will require the cooperation of other units is to utilize existing Qualifying Examinations from programs that best match the backgrounds of the students. For example, an entering student having a BS in electrical engineering, computer engineering, or computer science would be expected to take and pass the EECS Qualifying Examination according to the requirements of that department, while a student having a BS in Physics would follow the examination requirements of the Physics department.

I am not proposing an amendment at this time, but one option would be to make the following change to the proposed catalog description of the ESE PhD program:

Under “Requirements”, make the following changes:

No later than one year after entering the program, each student must take a qualifying examination, to be taken in a UTK academic unit selected by the student from an approved list maintained by the ESE PhD program and consistent with the student’s background. A student must be eligible to take the examination under the rules of the selected academic unit, must follow the timeline and process of that unit, and must pass the qualifying examination to proceed in the PhD program.

It would be best to have a discussion with the various departments such a policy would affect, but the time constraints placed upon the CIRE proposal do not appear to have allowed this.

The second issue that was raised in the post-meeting discussions was the timing of the Comprehensive Examination, which according to documents [2,6] is to take place at the end of the second year of study. I suspect that a large fraction of the faculty members in engineering and mathematics, if not the physical and biological sciences, will agree that this is not likely to be a

workable schedule. Students do not normally finish all PhD coursework within two years, and the University's expectation is that the Comprehensive Examination will be taken after all coursework has been completed. See the description of the Comprehensive Examination, available at http://catalog.utk.edu/content.php?catoid=2&navoid=27#requ_prog_requ, reproduced below:

The comprehensive examination (or the final part of this examination, when parts are given at different times) is normally taken when the doctoral student has completed all or nearly all prescribed courses. Thus, its successful completion indicates that, in the judgment of the faculty, the doctoral student can think analytically and creatively, has a comprehensive knowledge of the field and the specialty, knows how to use academic resources, and is deemed capable of completing the dissertation. The comprehensive examination must be passed prior to admission to candidacy. A written examination is required, and an oral examination is encouraged.

The faculty of the graduate program and/or the student's doctoral committee will determine the content, nature, and timing of the comprehensive examination and certify its successful completion. The department or committee may at its discretion subdivide the examination, administering portions of the examination at several times during the student's course of study. Students should review carefully the written statement from each doctoral degree program which details the timing, areas covered, grading procedures, and provisions for repeating a failed examination.

It will be interesting to see whether the proposed schedule for the Comprehensive Examination will work. I recognize that the goal is to have students fully focused on research after the first two years, and the CIRE Board of Directors appears to believe this is possible, given that students are not expected to perform teaching assistant duties during the first two years. I suspect this issue will be re-visited.

Program Design and Expectations

The program is to qualify for the 26% off-campus indirect cost rate, and 100% of the F&A goes back to the CIRE program for student support [1]. This undercuts the competitiveness of other on-campus PhD programs and does nothing to cover UT infrastructure costs.

Document [6] spells out the terms:

CIRE has developed and proposes to offer one of the first interdisciplinary PhD programs in energy science and engineering. This

new degree will provide breadth while preserving the depth and rigor of a PhD program. Topical areas have been chosen to align with unique ORNL capabilities and programs. ...

... CIRE faculty will be drawn from UTK and ORNL, with common eligibility criteria and appointment processes. CIRE faculty will mentor graduate students, develop and teach courses, develop and submit research and other funding proposals, and serve on CIRE committees including Curriculum, Graduate Coordinating, and Credentials committees.

CIRE Graduate students will join interdisciplinary research teams at ORNL that will expose them to large-scale, problem-oriented research and development, [foster] their ability to work across disciplinary boundaries, encourage them to approach research problems from new directions, and strengthen their ability to work in teams. ...

CIRE is being initiated with startup funds from the State of Tennessee. Competitively selected students will be supported jointly by UTK and ORNL, with UTK supporting students primarily during coursework, and ORNL supporting students during research. Additional research support and other funding will be actively sought from federal and industry sponsors. Financial projections demonstrate sustainability for at least five years with reasonable levels of additional external funding required thereafter.

[From pages 4-5; spelling correction noted]

The reality of this program is it provides an opportunity for ORNL researchers to direct UTK/UTIA PhD students and employ these students in their research programs, **after** the state pays for the first two years of their education (coursework). UTK/UTIA students work in these programs now, but under UTK/UTIA terms: a UTK/UTIA faculty member or an ORNL staff member that has been vetted by the faculty of a UTK/UTIA department and holds an appropriate UTK/UTIA appointment directs each student's PhD research. The **benefit** to UTK/UTIA is supposed to be attraction of highly qualified students, but if the students only contribute toward research and development activities at ORNL, the benefit to UTK/UTIA will be minimal and, in my view, the program will have failed.

It is incumbent upon the CIRE Board of Directors, CIRE Faculty, the UT Chancellors, and the ORNL Director to ensure that CIRE benefits the research and development programs at both UTK/UTIA and ORNL. I understand from my discussions with Lee Riedinger that a financial model indicates that the program can be self-sustaining if at least 75% of the students choose to perform their research and development activities at ORNL (leading to F&A

generation to support the program). This is an acceptable outcome in my view, but if 90-100% of the students choose to work at ORNL, there is little reason for UTK/UTIA involvement. Students who enter the ESE program have the choice to work in R&D environments at either UTK/UTIA or ORNL – although they will be quite expensive compared to most other UTK/UTIA graduate students on UTK/UTIA R&D contracts and grants.

Page 10 of [1] states: “We have no funded faculty lines.” This is the #1 problem with this proposal. ORNL appears willing to contribute – at least in name – staff members to be members of the CIRE faculty, although it is clear that government contracting regulations require their time to be charged to ORNL laboratory budget lines. Thus, the only involvement of ORNL staff that can be expected is the degree to which ORNL staff members participate in R&D activities through CIRE. The costs for ORNL staff to teach ESE courses, for example, can not be charged to Federal R&D budget lines, and Lee Riedinger told me that the CIRE budget (e.g., the \$6M start-up funds from the state, and later the revenue generated by F&A) must cover this – as they would be expected to cover UTK/UTIA faculty and staff time for a course offered by ESE.

An issue that Lee Riedinger clarified during our meeting concerns applicable F&A rates: the 26% rate, and the allocation of all F&A to CIRE student support, only applies for ORNL or external funding supporting students working at ORNL. An on-campus F&A rate will apply for projects routed through CIRE from UTK/UTIA, although it is still not clear how F&A funds received from these contracts and grants will be allocated and distributed within UTK/UTIA. This needs to be made clear.

I personally find it difficult to imagine circumstances where a current UT faculty member who is not already heavily invested in ORNL activities would want to participate in a CIRE program: He or she would expect to:

1. **Lose**, at least partially, revenue derived from RIF that is normally used to support campus R&D infrastructure,
2. **Commit** “time, research support, expertise, etc.” to CIRE at **no cost**, and
3. **Actively “engage”** in CIRE activities, supervision and support of a graduate student, and submit ideas for research.

This would be at the expense of his or her development of on-campus R&D infrastructure and activities – each of us has a finite amount of time and resources, and our #1 priority must be the Knoxville campus. The time commitment at no cost is especially troubling in the UTK College of Engineering, where research contracts and grants are expected to cover the costs (level of effort) of faculty members’ time worked on these R&D programs, and where RIF returned to the college, departments, and faculty members as a percentage of F&A receipts funds much of the college’s

research infrastructure – a much different funding model than one sees in, for example, the UTK College of Arts & Sciences. The fact that some non-engineering UTK departments provide faculty time on ORNL projects at no cost to ORNL is already problematic for faculty members in the College of Engineering because it creates an expectation that engineering faculty members might do the same. The proposed CIRE structure and processes stand a good chance of aggravating this situation. At a minimum, they make it very difficult for many highly productive UTK College of Engineering faculty members to consider supporting CIRE initiatives. At worst, a competitive situation could develop that would be detrimental to the overall UT/ORNL/DOE relationship.

Major Areas of CISE Research

Page 7 of the presentation lists “10 national energy challenges” under “six major areas of research”. The areas too focused. They speak to ORNL’s focus rather than the possibilities of a UT graduate research program. Specifically:

- a. Under bioenergy/biofuels: “develop new generation ethanol”. Why not biodiesel, biochar, methane, or other approaches toward carbon sequestration?
- b. Under energy conservation & storage: The only two topics are storage and high-mileage cars?
- c. Under renewable energy: “lower cost of solar power”. This is a materials & device physics problem, unless you are talking about scale-up, in which case it’s not within our (either ORNL’s or UT’s) purview: The technology has already scaled well past the point where a University or a national laboratory (or a solar power plant in West Tennessee) is going to make a difference – not to mention that Tennessee is a less-than ideal location for solar power because of the cloud cover. But why limit this to solar? What about geothermal and OTEC, to name two alternatives? In addition, renewable energy is strongly related to conservation (example: methane or biodiesel from waste, wind energy, and distributed storage and generation).
- d. Under environmental and climate sciences: As a global civilization, we need to do a lot better than “respond to climate change”; otherwise, the only reasonable response is likely to be “move North”.

CISE research programs should reflect national priorities and the interests of UTK/UTIA faculty, not just ORNL’s areas of focus.

Interaction – and Competition with – other UTK/UTIA Units

Page 17 of [1] addresses coordination with colleges, departments, and other centers. It talks about “Centers of potential overlap with CIRE”, but does not list one department within the College of Engineering – ALL of which

probably overlap and will be in competition with CIRE for students and funding. It lists as issues “potential competition for the same students” and “which entity submits grant proposals”.

I have become aware of at least one faculty group within the College of Engineering that approached the CISE Board of Directors and ORNL management and offered assistance in forming a new CIRE program direction – but was rebuffed, apparently because the ideas are not aligned with ORNL’s current research projects. This problem needs a rapid solution; if the situation further deteriorates few faculty members within the College of Engineering are likely to demonstrate a willingness to work with CIRE.

I distributed an earlier version of this document to the faculty within the College of Engineering a few days ago, and I have encouraged feedback multiple times. To illustrate the depth of concern within the College of Engineering, I have received seven responses (both email and by phone), and all were negative. I am continuing to encourage my colleagues within the College of Engineering to contact me.

We are setting up an academic structure to compete with our existing academic structures. It has a lower overhead rate and contributes none of that overhead to campus operational costs or infrastructure outside of CIRE (other than in-state student fees, which do not cover costs). We are doing this for an asserted – but untested – benefit of access to presumably better students – the only benefit, since we already do or can add all of the things listed, including the interactions with ORNL, using our existing academic structures and degree programs – and have done many of these for decades. We are planning to pay these students more than the rates that our academic units typically offer, which immediately sets up a competitive situation for the same talent pool and will probably cause an increase in costs of students to on-campus research projects. We are offering our faculty members no pay, no RIF, and no support while inviting them to apply to join the CIRE. Should we do this?