ISSUE FORUM 4: "MECHANISMS TO IMPROVE RESEARCH IMPLEMENTATION AND TECHNOLOGY TRANSFER"

GOALS

A fundamental objective of the NEES Collaboratory is to engaging stakeholders, practitioners, and industry in processes to accelerate the rate at which research discoveries are integrated into technologies and products for engineering practice. The NEES shared use facilities enable a broad pool of researchers to access state-of-the-art facilities, and the NEESR program is structured to foster community growth and information exchange through collaborations. However, to date, there has been little involvement of infrastructure owner/operators or the practicing engineering design profession, and no clear comprehensive strategy has yet been devised to synthesize research findings and deliver technologies and products that can directly and broadly used in practice. This Issue Forum will:

- Examine the complementary roles of fundamental (discovery oriented) research and applied (implementation oriented) research and technology development and assess the current balance of the NEES research portfolio;
- Clarify the distinction between "technology transfer" (making research knowledge readily available) vs. "research implementation" (synthesis/integration and consensus-building for delivery of specific technologies and products), and potential roles for research and stakeholder institutions.
- Explore immediate opportunities for increased involvement of end-user stakeholders in the definition of research priorities, monitoring and guiding research progress, evaluation of research proposals, and assessment of research results.
- Explore longer-range strategies for achieving a balanced portfolio of fundamental and applied research that addresses high priority technology and product needs of stakeholders within a competitive research environment.
- Initiate the development of a structure and processes for focused partnering with stakeholders, practitioners, and industry and implement a project by mid 2006.

SESSION COORDINATION

Session Moderator: **Carl Stepp**, NEES Director
NEESinc Facilitator: **Cliff Roblee**, NEESinc Executive Director

PANELISTS & PERSPECTIVE

Mike Keever:	Caltrans, EQ Engr., End-User Needs for Fundamental & Applied Research
Ron Mayes:	SGH Inc. Consulting Structural Engr., Role of Innovative Practitioner
Joy Pauschke:	NSF NEES Program Officer, NSF Interests & Limitations re: Implementation
Jim St Pierre:	NIST BFRL Materials & Constr. Research, Role of Problem-Focused Research

PROPOSED STRATEGIES FOR ACHIEVING GOALS

1. NEESinc should develop a highly-inclusive partnering policies that maximize participation of earthquake risk stakeholder organizations, industry, and engineering practitioners to allow:
    a) Access to excess shared-use equipment site testing capacity at NEESinc-subsidized rates for non-proprietary research that meets NEESinc standards.
    b) Utilization of NEES' central data repository for all data sets that meet NEESinc standards that were generated at either NEES or non-NEES facilities.
    c) Participation in, and enhancement of, NEES' EOT programs.
    d) Development of research needs.

2. NEESinc should form an Implementation Working Group consisting of stakeholders and industry representatives, and practitioners to serve as a continuing resource to connect NEES research to practice, and to serve as a conduit for practitioner views of NEES accomplishments and directions.
3. NEESinc should host a series of workshops/interviews with earthquake research stakeholders (owner/operators of infrastructure, code and policy organizations, responders, etc.) to assess their critical and strategic earthquake engineering research needs. Findings from these activities will be used to:
    a) Develop current practitioner and stakeholder priorities for earthquake engineering research to complement, synthesize, and update assessments such as the NAS "Preventing EQ Disasters" report, the EERI "Securing Society" report, the ATC-57 "The Missing Piece" report, etc.
    b) Develop candidate pools of leading earthquake professionals and representatives of industry and major stakeholders (e.g. A&E Firms, FHWA & State DOT's, Utilities & DOE, Insurance & FEMA, Dam Owner/Operators, Building Owners & NIST, Construction Industry & Trade Associations, etc.) to serve to:
    c) confidentially assist researchers in developing their proposals to meet implementation objectives
    d) provide NSF with lists of qualified reviewers of proposals
    e) guide, on an on-going basis, the execution of a research project to assure results are presented in a form that is compatible with practice's needs
4. NEESinc should work with NSF and stakeholders to identify potential leveraging and cost-sharing mechanisms for matching industry-sponsored initiatives on problem-focused research and develop cooperative agreements that actively engage the organizations in NEESinc research and delivery.
5. NEESinc should develop mechanisms to encourage researchers to develop, and practitioners to engage in, blind prediction exercises associated with experimental programs that aim to:
    a) Encourage dialog between the research and practicing communities.
    b) Illuminate the critical role of modeling uncertainty in engineering simulation as a means to stimulate and prioritize research strategies to improve overall predictive capabilities of simulation.
    c) Illuminate the benefits and limitations of various simulation strategies used in research and practice.
6. NEESinc should explore opportunities for researchers to participate in practice-oriented testbed or demonstration projects that would facilitate technology transfer to practitioners and provide valuable feedback to researchers regarding critical gaps in emerging technologies.

INITIAL E-POLLING QUESTIONS (Additional questions may be developed onsite)

Q1) To assist with interpretation of the results, please identify your primary role in NEES:
1. Researcher
2. Practitioner or Earthquake Risk Stakeholder (Infrastructure Owner/Operator, Code/Regulator, etc.)
3. Other

Q2) Do you agree with the following statement: "The current NEES research portfolio addresses the immediate concerns of practicing professionals."
1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
6. Insufficient Information to Comment

Q3) Do you agree with the following statement: "The portfolio* of NEES research strikes an appropriate balance between fundamental and applied research."

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
6. Insufficient Information to Comment

** portfolio of pre-NEES and NEESR-03 attached.*

Q4) Do you agree with the following statement: "There is a clear need to create more opportunities for meaningful technical collaboration between researchers and practitioners."

1. Strongly Agree
2. Agree
3. Neutral
4. Disagree
5. Strongly Disagree
6. Insufficient Information to Comment

Q5) Please rate each of the following strategies on a 1 (lowest) to 5 (highest) priority scale for NEES to improve research implementation and technology transfer.

1. High Priority
2.
3. Medium Priority
4.
5. Low Priority

Strategies to Rate:

a) Develop a highly-inclusive partnering policy
   1. High Priority
   2. Medium Priority
   3. Low Priority

b) Create an Implementation Working Group
   1. High Priority
   2. Medium Priority
   3. Low Priority

c) Host workshops/interviews with stakeholders to identify critical needs.
   1. High Priority
   2. Medium Priority
   3. Low Priority

d) Identify cost-sharing strategies for industry-sponsored research initiatives.
   1. High Priority
   2. Medium Priority
   3. Low Priority

e) Develop blind prediction exercises & encourage industry participation.
   1. High Priority
   2. Medium Priority
   3. Low Priority

f) Develop opportunities for researchers to participate in testbed projects.
   1. High Priority
   2. Medium Priority
   3. Low Priority

Current NEES Research Portfolio

Pre-NEES Demonstration Projects

Behavior of Braced Steel Frames With Innovative Bracing Schemes - A NEES Collaboratory Project
Demonstration of NEES for Studying Soil-Foundation-Structure Interaction
NEES Experimental Project for Verifying Full-Scale Semiactive Control of Nonlinear Structures
Development of a Seismic Design Methodology for Precast Floor Diaphragms
1/5th-Scale Model MUST-SIM Education and Training Laboratory

NEESR-03 (Awarded October 2004)

Seismic Performance of Bridge Systems with Conventional and Innovative Materials
Sidesway Collapse of Deteriorating Structural Systems
Physical Modeling of 3D Tsunami Evolution Using a Landslide Tsunami Generator
Highly Damage Tolerant and Intelligent Slab-Column Frame Systems Through Combination of Advanced Materials and Embedded Wireless Sensing
Dynamic Passive Pressure on Full-Scale Pile Caps
Large-Scale Testing and Micromechanical Simulation of Ultra-Low-Cycle Fatigue Cracking in Steel Structures
Self-Centering Damage-Free Seismic-Resistant Steel Frame Systems
Seismic Behavior, Analysis and Design of Complex Wall Systems
Evaluation of Ground Rupture Effects on Critical Lifelines
In Situ Determination of Soil Modulus and Damping as a Function of Level of Strain