

NPI

NUCLEAR POWER INSTITUTE

The Nuclear Power Institute Programs for Human Resource Development for the Nuclear Industry

IAEA Conference on Human Resource Development

Vienna, Austria

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**TEXAS A&M ENGINEERING
EXPERIMENT STATION**

Acknowledgements

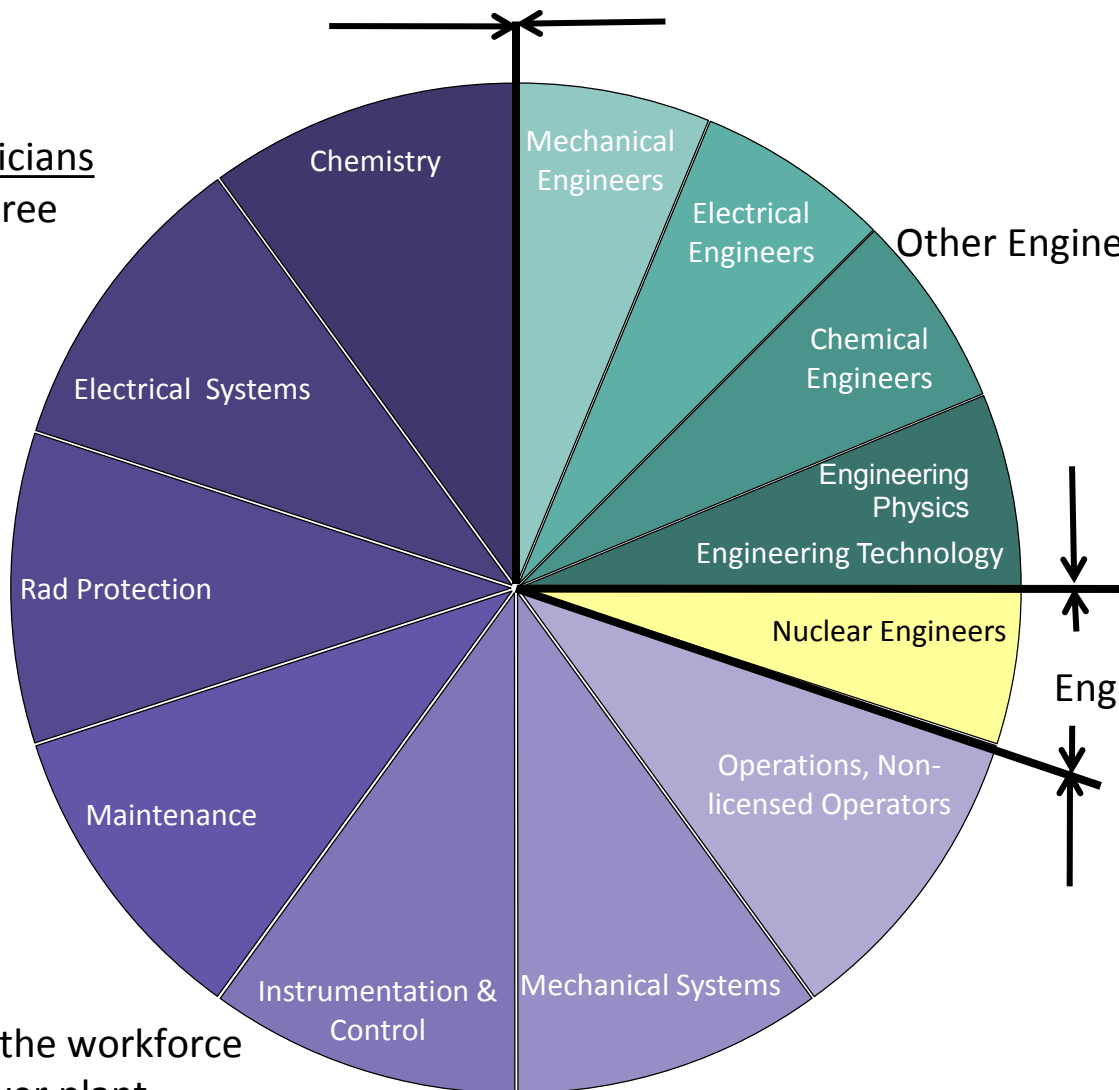
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 - Rafael Flores, Ken Peters, Doug Davis, Mike Blevins and Bobby Bird, Comanche Peak Nuclear Power Plant
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 - Judge Nate McDonald, Matagorda County; Judge Michael Ford, Somervell County, Judge Phillip Spenrath, Wharton County, Judge Darrell Cockerham, Hood County
 - Dr. John Zerwas and Rep. Dennis Bonnen, Texas Legislature

Broader Needs for the Nuclear Workforce

The “Other than Nuclear” Challenge

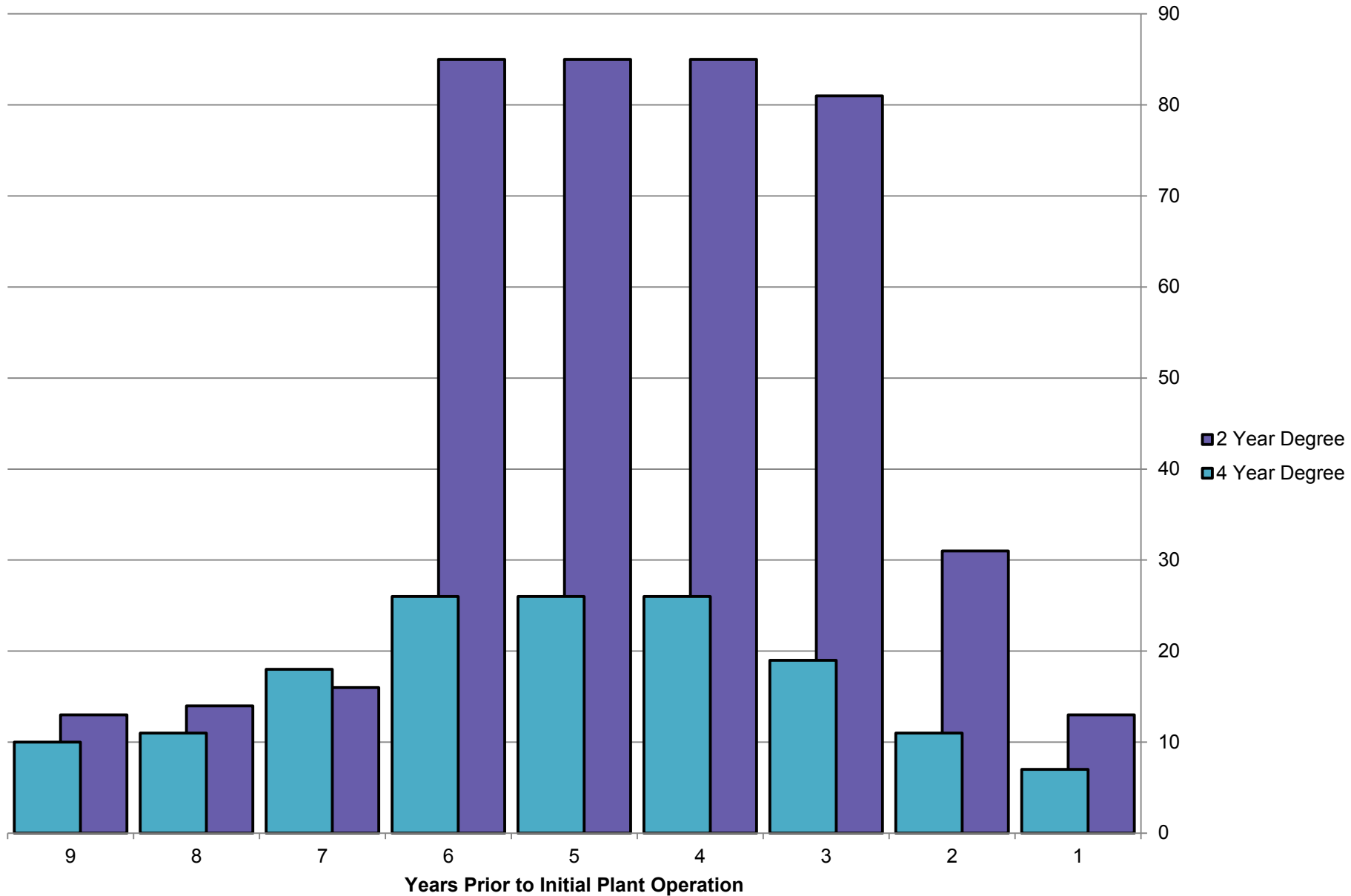
Technologists/Technicians
2-year Associate Degree
Backgrounds

Engineers
4-year Degrees
Other Engineering Disciplines



The “U.S. Model” for the workforce
at a nuclear power plant

Timing of Workforce Employment Before Plant Operation



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Nuclear Power Institute

- NPI is a *partnership* of
 - *industry,*
 - *universities,*
 - *two-year technical and community colleges,*
 - *high/secondary schools and junior highs,*
 - *students and teachers,*
 - *communities,*
 - *stakeholders,*
 - *elected leaders,*
 - *state, federal, and international agencies*
- The NPI focus is on *preparing the workforce* for the nuclear industry and *building public understanding and acceptance* of nuclear energy

Engineers ***Diplome-Certificate Program*** ***A Unique and Innovative Approach***

Partner Universities

- Mech Engr
- Elec Engr
- Chem Engr
- Civil Engr
- Engr Physics
- Engr Technology



NPI Nuclear Power Diplome- Certificate

- Fundamentals
- Systems-
BWR/PWR
- Operations
- Human
Performance



Outcome
Graduates with
***Academic
Backgrounds,
Credentials***
and
Hiring Advantages
for Jobs at
Nuclear Power Plants

Approach: Distance delivery of courses based on industry input and needs.

System Engineering Initiative

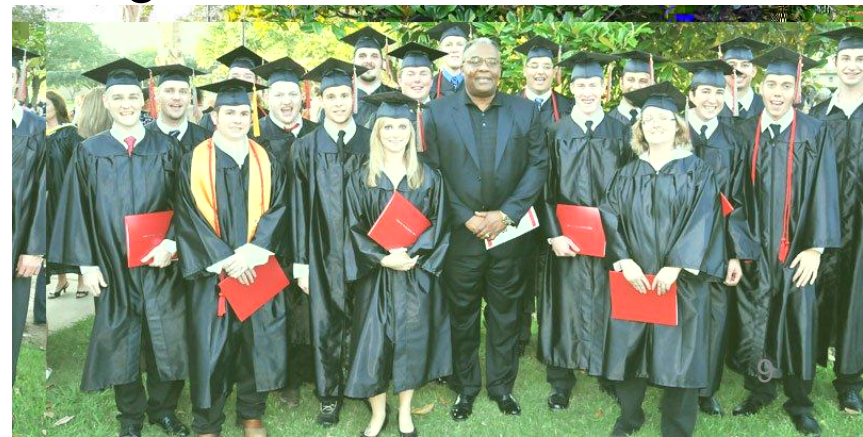
Engage undergraduate engineering students in interdisciplinary & multilevel team projects sponsored by government / industry to:

- Problems defined by industry partners
- Visit to nuclear power plants
- Work with industry mentors
- Enhance the engineering education of students through real world experiences
- A new educational approach through “externships”



Technologist/ Technician Programs

- *Partner* with 2-year community or technical colleges
- Graduates receive and Associates degree in
 - *Electrical and Electronic Systems*
 - *Digital Instrumentation and Control*
 - *Radiation Protection*
 - *Non-licensed operations*
- Curriculum includes courses in *mathematics, science and engineering systems*
- *Strong preparation* to enter into training programs at nuclear power plants
- National Uniform Curriculum Project-in 39 community colleges in the U.S.



Outreach Programs

*Nuclear
Power
Institute*



*Teacher
Programs*

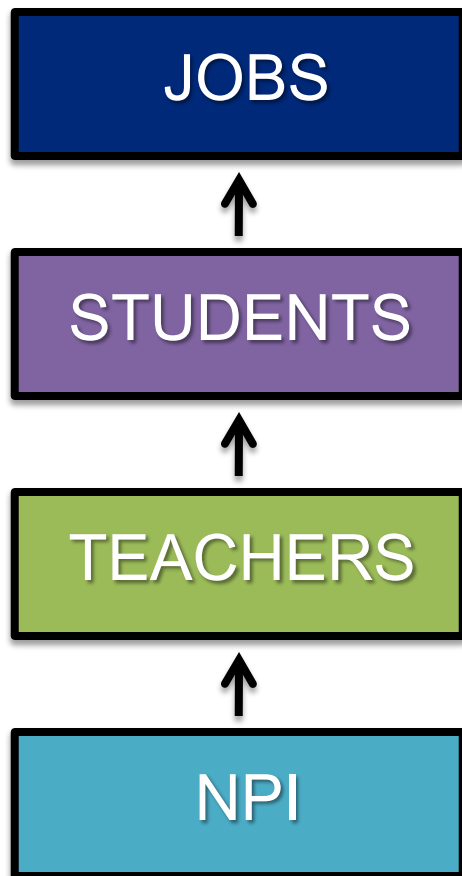


*Student
Programs*



*Communities
and Leaders*

NPI Programs for Teachers



Progression of Programs

International Teacher
Exchange

Counselors Making
Occupational Readiness
Exciting (C-MORE)

Science on Saturday (SOS)

Enrichment Experiences in
Engineering (E³)

Teacher Summit

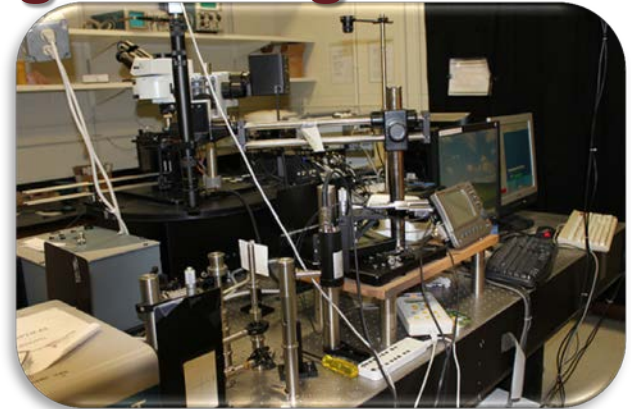
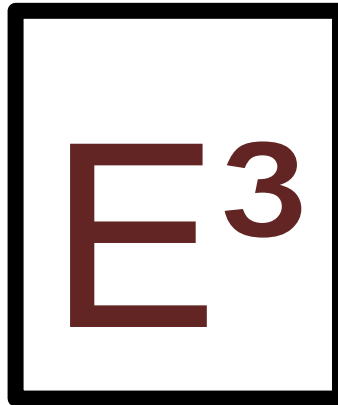
Teacher Workshops

Conference for the Advancement
of Science Teaching (CAST)

Teachers *Enrichment Experiences in Engineering*



*Enhance lab skills &
techniques*



*Experiences with the
latest in engineering
research*



Practical experience at
the nuclear power
plant.



POWER SET

- ***Powerful Opportunities for Women Eager and Ready for Science Engineering and Technology***
- High school/secondary school girls selected to apply for membership
- Educational tools and support to pursue STEM studies and careers



Students Power GRID

- ***Girls Responding to Industry Demands***
- Extension of POWER SET
- Focus on junior high school girls
- Encourage their participation in math and science through high school



WIT

- ***Workforce Industry Training***

- Mentoring by industry professionals
- Site visits to local industry partners
- Professional development activities
- Educational visits to universities and community colleges
- Community service events
- Scholarship opportunities

Students

BRT

- ***Boys Resourcing Technology***

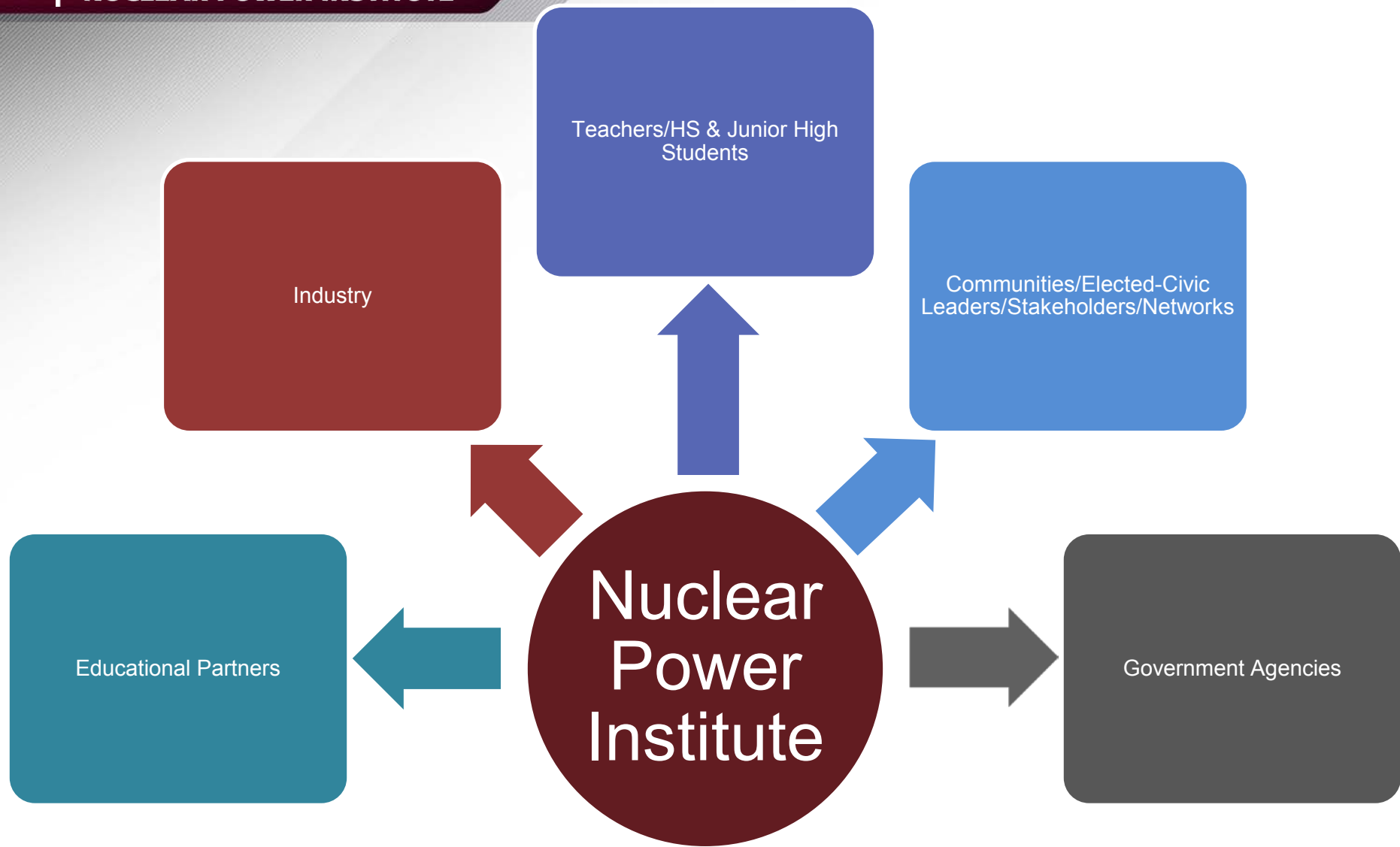
- Extension of WIT
- Focus on elementary and junior high boys
- Engage in academic activities
- Stay focused on STEM path



Science on Saturday ***For students and the community***

- Demonstrations and experiments geared to junior high and high school students and to families
- Organized and presented by POWER SET and WIT members
- SOS aims to stimulate scientific inquiry and promotes student interest
- Third event held April 5, 2014 at Wharton High School
- Anticipated 300 participants, over 400 took part





International Collaborations

- Many formats: workshops, meetings and training courses
- Duration: one week to one month
- Number of participants: 5-45
- Multi-disciplinary groups
- Sponsorship by IAEA or national groups
- Include nuclear power plant visits, reactor laboratories, “Disaster City” exercises, meet elected leaders, see outreach activities
- Countries: Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Czech Republic, France, Indonesia, Japan, Jordan, Kenya, Malaysia, Mongolia, Nigeria, Russia, Thailand, Turkey, UK and Uruguay



STP Nuclear Power Plant



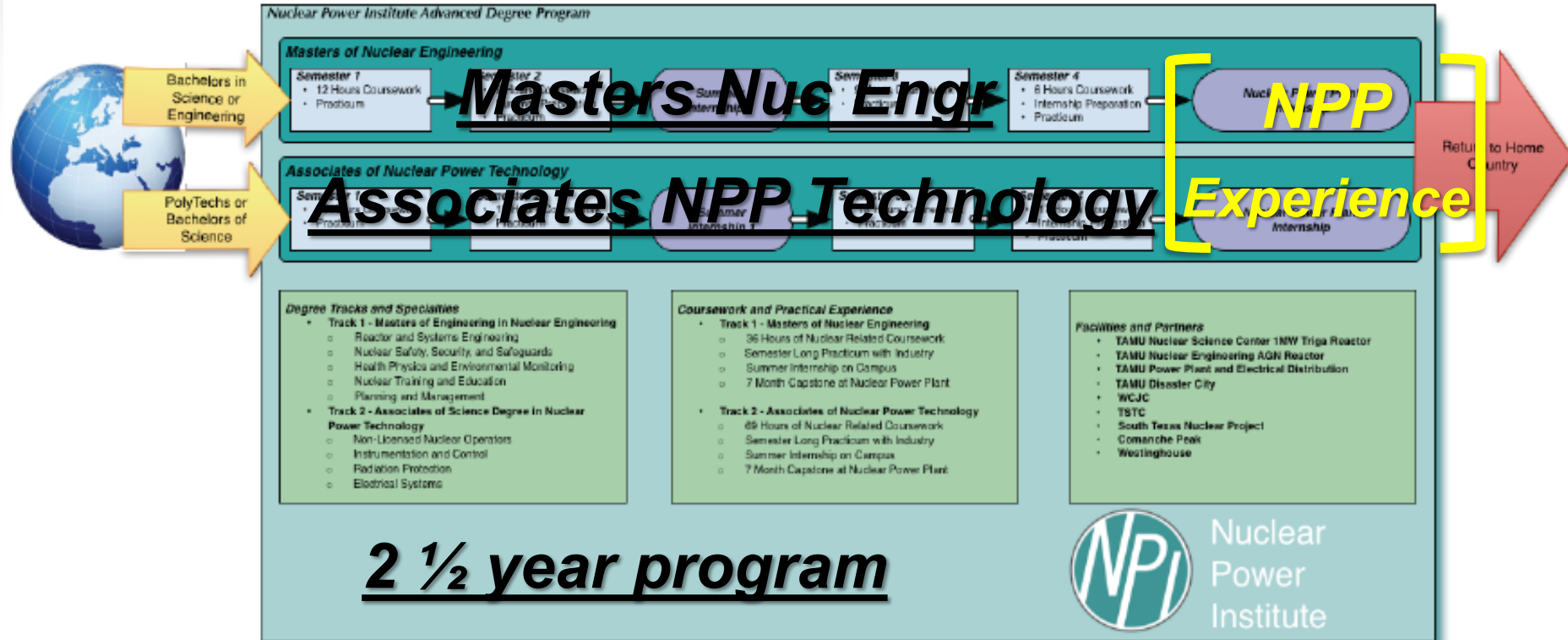
A&M Nuclear Science Center



“Disaster City” Emergency Response Exercise

“Roadmap to Operational Experience”

Opportunity for work experience in an operating nuclear power plant



Principal Conclusions

1. NPI is a *full-scope, end-to-end, integrated* approach to human resource development. *Participation* of government and government agencies, and elected officials and decision makers is *vital*. These key individuals and organizations *encourage the effort*, and *provide support*, a *voice and advocacy* for NPI and its programs.
2. *Critical role of vocational training*. The majority of the workforce does not involve only B.S. level engineers, but are graduates from *two-year programs that are developed in collaboration with industry* that prepare them for careers as technologists and technicians at a nuclear power plant.

Conclusions (continued)

3. In education and training, education is only part of the story.
Collaboration with industry results in:
 - curricula, material, inputs and programs,
 - opportunities for students to benefit from industry mentors and get onsite experience, and
 - work on real-world, industry defined problems.

4. *Outreach* is instrumental in:
 - engaging with the *next generation* both for support of nuclear power and in building the workforce, and
 - *generating vital contacts with the community* to *foster public understanding and acceptance* of nuclear energy.

A Key Outcome



One of our Main Goals!