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**Nuclear Culture
The critical element of success of a nuclear power program**

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Nuclear Culture

**The critical element of success of a
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Nuclear Science and Technology

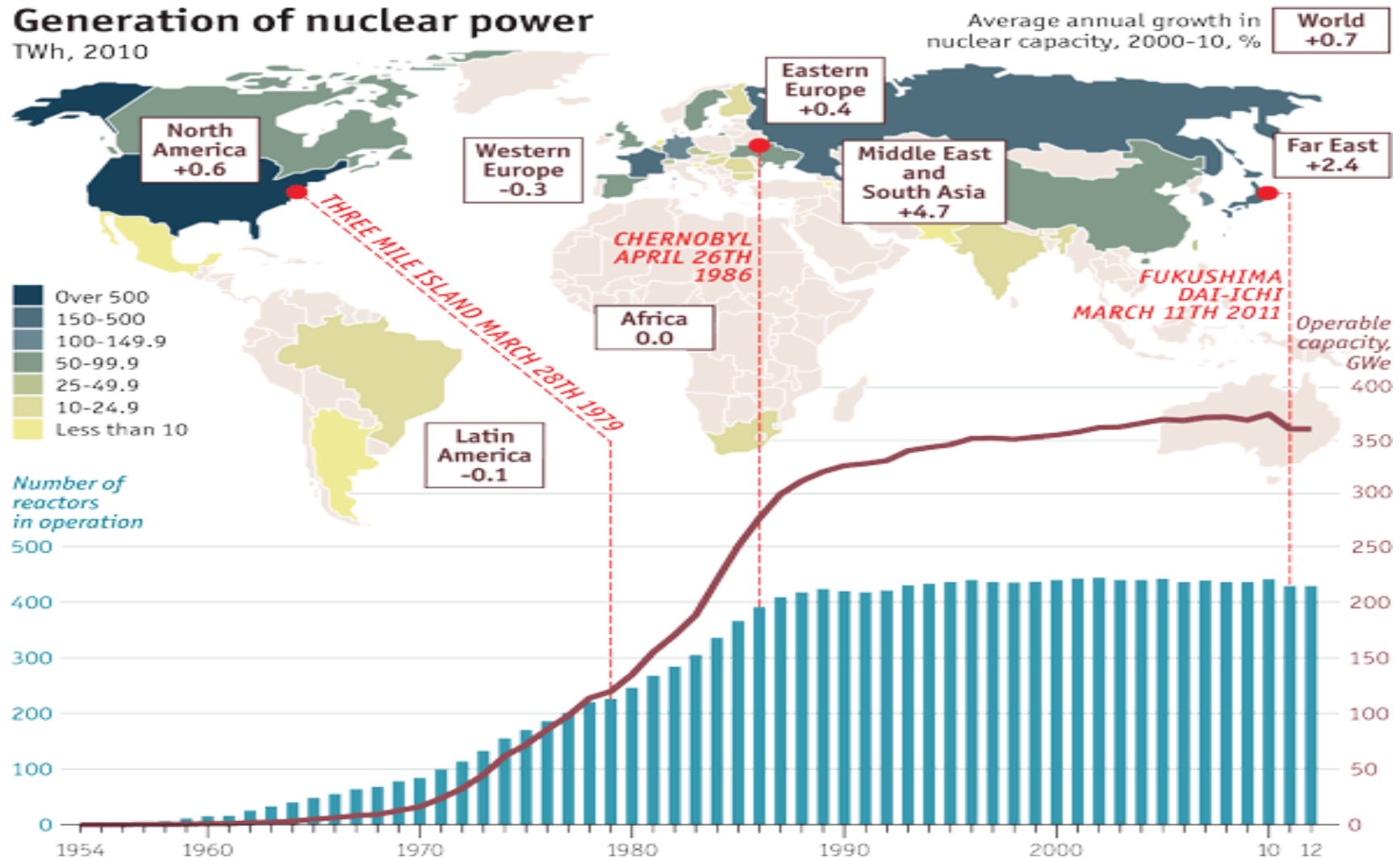
a remarkable achievement of human development



Nuclear power development

Generation of nuclear power

TWh, 2010



Sources: "Nuclear Power in a Post-Fukushima World", Mycle Schneider et al; IAEA

Building nuclear power

- Creating a **national nuclear power program is far more complex** than simply hiring a contracting firm and turning the key.
- It is people, not contracts, that build and operate nuclear programs; **the greatest challenge each nation faces is in developing a successful “nuclear culture”** within the workforce and within the country.

The “Culture” triad

- .Developing formal **education and training** programs to provide subject matter skills and a strong awareness of nuclear culture norms.
- Implementing **communication and change management** processes to constantly reinforce and internalize proper behaviors in all stakeholders.
- Creating performance measurement and improvement systems to **promote a culture of continuous improvement.**

“Nuclear culture” for all

- Ultimately, successful nuclear power programs will be judged not by their ability to construct plants to cost and schedule, but by their ability to develop a reputation for meeting and exceeding the high standards of the nuclear industry and facilitate the construction and operation of additional facilities.

Nuclear Culture Building: The Core Competence

- **Acquiring nuclear expertise is not that difficult** and can be done by leveraging the regulatory expertise of US and European nuclear authorities and the design and construction experience of large international consortia of contracting firms, including RO Korea, China, Japan and others.
- **Establishing a nuclear culture is different.**
- It cannot be outsourced, and over the long term, **maintaining a strong nuclear culture will be the core competency** of any successful nuclear program.

Strong Nuclear Culture

- A strong nuclear culture equates to a workforce that is focused on:
 - **SAFETY**
 - **quality,**
 - **accountability,**
 - **performance.**
- Nuclear quality must be the ultimate priority.
- Nuclear quality standards require that facilities are designed, built, operated, and decommissioned in the safest manner possible.

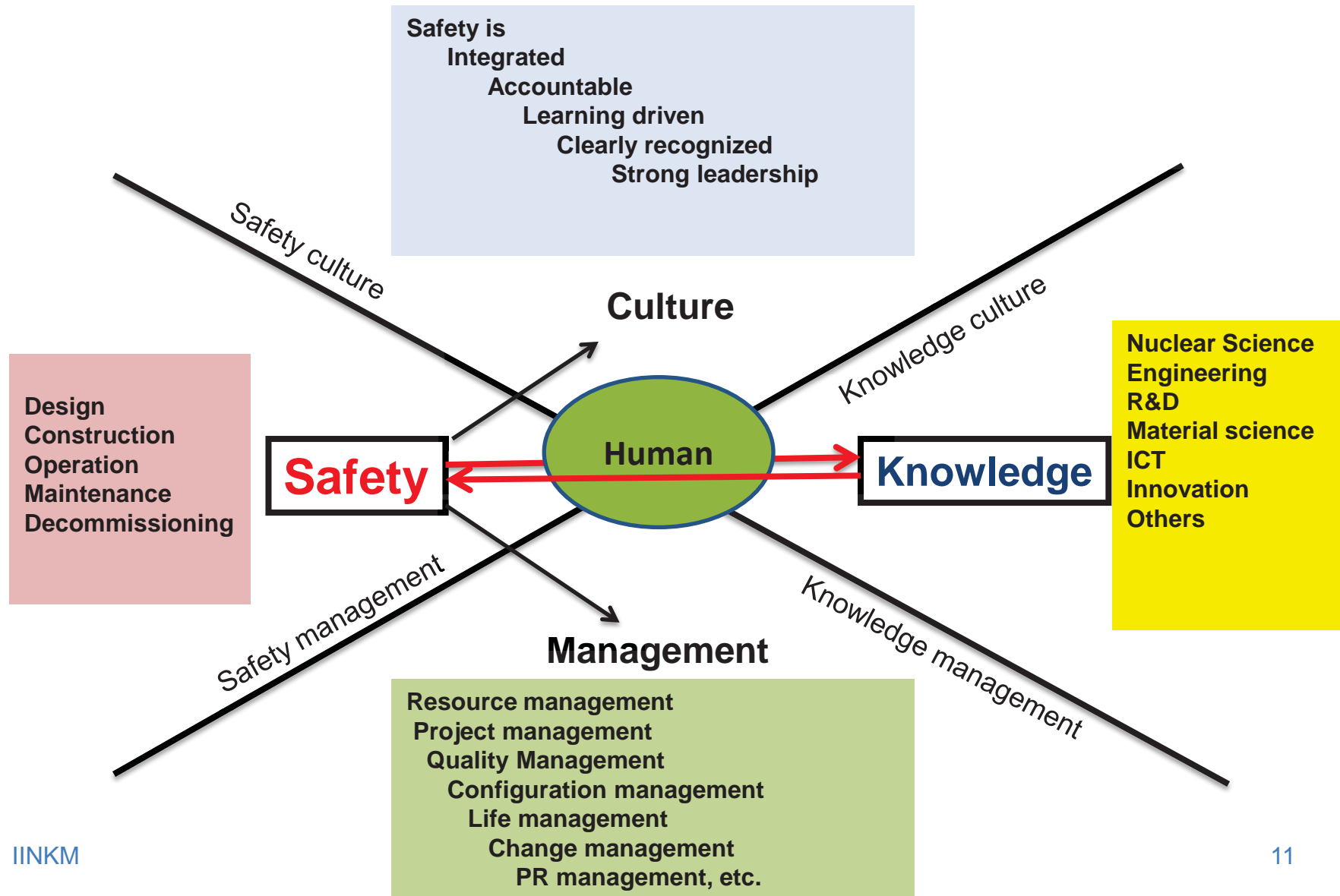
Strong Nuclear Culture ctd.

- A **strong nuclear culture** will extend these same nuclear safety principles to radiological safety, industrial safety, and environmental safety.
- **Accountability** and optimizing individual performance are critical concepts:
- **Each staff member must recognize that he is accountable** for ensuring the highest level of quality and safety, from the most senior executive to operations, maintenance, and support staff.

Role of Vendors and EPC contractors

- Contractors may neglect human resource development, arguably the most crucial aspect in the success of a nuclear construction project.
- The project owner takes on substantial operating, regulatory, and financial risk, and therefore must plan for and provide significant nuclear safety oversight in-house.
- The “project owner” has to deal with contractors and build their “nuclear culture” to the world standard.

Interfaces of Nuclear Culture



Sustaining “nuclear culture”

- Once a nuclear plant becomes operational, **nuclear culture weaknesses often manifest as a root cause of poor performance.**
- **Disregard for procedures among skilled laborers and imprudent decision making among senior management** are examples that have led to extended forced shutdowns at troubled nuclear facilities.
- **Strict attention to a nuclear safety culture** must be maintained throughout a plant’s operating life. This is even more critical in regions without extensive operating experience.

Nuclear culture demonstration

- ..Does management put nuclear safety first at all times?
- ..Does management cultivate a questioning attitude?
- ..Do workers adhere to procedures all of the time?
- ..Do workers fear retribution for raising safety concerns?

Conclusions

- The construction and **operation of new nuclear facilities is an important step in diversifying energy supply for many countries** as well as reflecting on each nation's ability to execute commercial megaprojects.
- Building a **robust nuclear culture** in the country and in the region and at each project site will be essential to success.

Chernobyl

“After being at Chernobyl, I drew the unequivocal conclusion that the Chernobyl accident was ... the summit of all the incorrect running of the economy which has been going on in our country for many years.”

*Acad. Valeri Legasov, pre-suicide tapes
Chief Investigator Chernobyl accident.*



Fukushima

“What must be admitted – very painfully – is that this was a disaster which fundamental causes are to be found in the ingrained conventions of the national culture: the reflexive obedience; reluctance to question authority; devotion to ‘sticking with the program’; groupism and insularity”.



Kiyoshi Kurokawa
Chairman Independent
Investigation Commission
On Fukushima accident

How do you see role of “nuclear culture” in the success of your nuclear program?

COMMENTS PLEASE?