

**International Conference**

**“65 Years from First NPP start in Obninsk”**

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# **Knowledge Transfer for Sustainable Nuclear Power Programs**

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# AGENDA



**Nuclear energy – Quo vadis?**

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**Knowledge transfer? WHY?**  
**What should be transferred and how?**

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**Some thoughts and conclusions**

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# Prologue



Когда Святой Петр встретил Иисуса, когда он бежал от распятия в Риме, Петр задал Иисусу вопрос - Quo vadis?

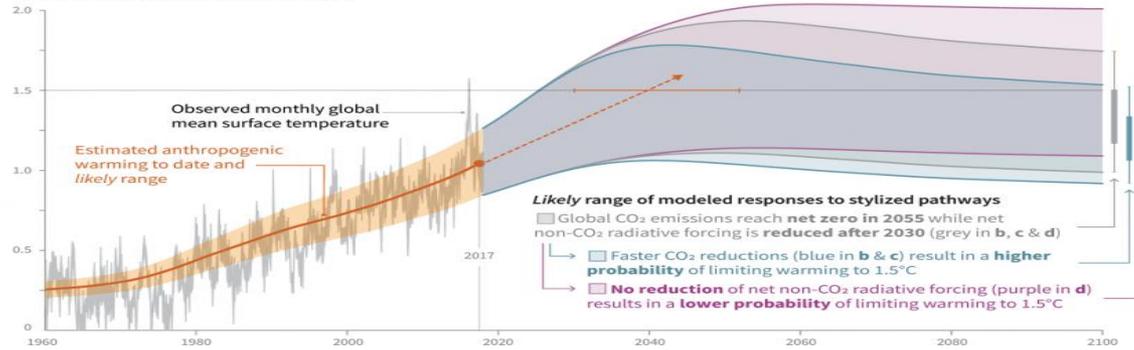
Иисус ответил: «Я иду в Рим, чтобы снова быть распятым».

Это побудило Петра набраться смелости, чтобы продолжить служение и в конце концов стать мучеником.

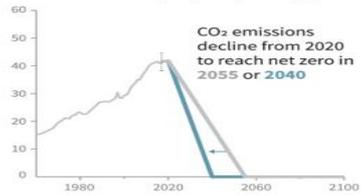
# Cumulative emissions of CO<sub>2</sub> and future non-CO<sub>2</sub> radiative forcing determine the probability of limiting warming to 1.5°C

## a) Observed global temperature change and modeled responses to stylized anthropogenic emission and forcing pathways

Global warming relative to 1850-1900 (°C)

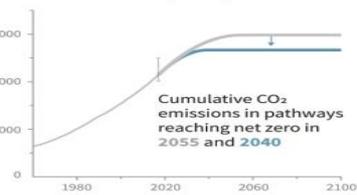


## b) Stylized net global CO<sub>2</sub> emission pathways



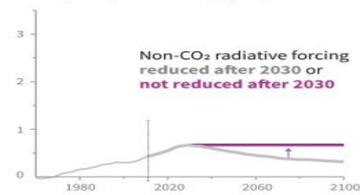
Faster immediate CO<sub>2</sub> emission reductions limit cumulative CO<sub>2</sub> emissions shown in panel (c).

## c) Cumulative net CO<sub>2</sub> emissions



Maximum temperature rise is determined by cumulative net CO<sub>2</sub> emissions and net non-CO<sub>2</sub> radiative forcing due to methane, nitrous oxide, aerosols and other anthropogenic forcing agents.

## d) Non-CO<sub>2</sub> radiative forcing pathways



# The Challenges of today!

## ➤ Nuclear power and “energy markets”

- High upfront capital costs
- Long lead times (planning, construction, etc) payback periods ( 10 years on average)
- Regulatory / policy risks (Change in policy)
- Market risks, ( New energy sources)

## ➤ Proliferation and Security concerns

- Access to proliferation sensitive parts of the fuel cycles
- Terrorism and local wars?

## ➤ Public concerns – acceptance

- Radiation impacts of severe accidents. Wastes as potential burden.

## ➤ Nuclear infrastructure!

- Knowledge, competence and skilled labour force
- Understanding Nuclear Quality and Safety culture

## ➤ **GEOPOLITICS !**

# KNOWLEDGE TRANSFER

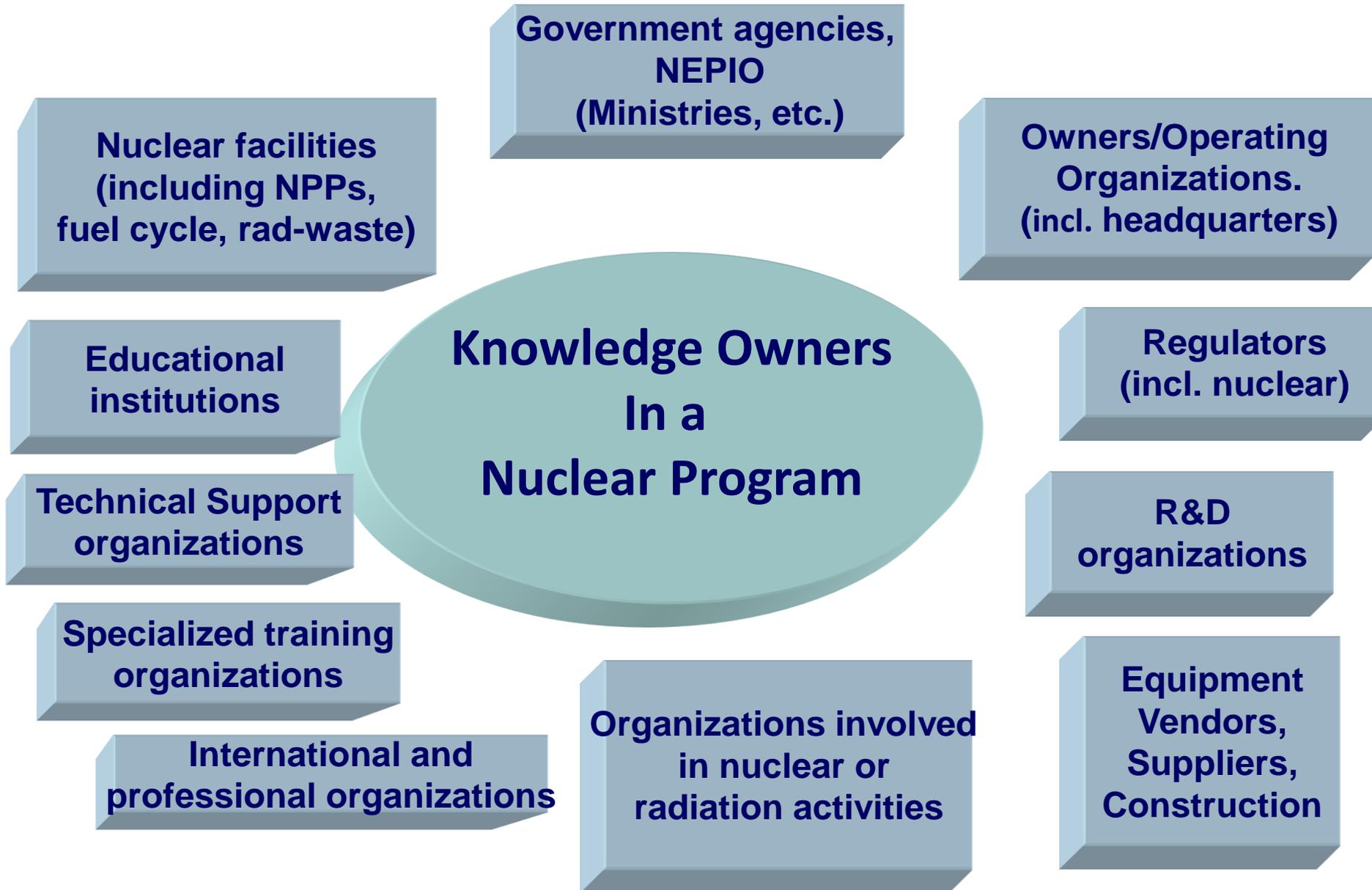
[Davenport and Prusak \(2000\)](#) suggested that KT is the process of transmitting (presenting or sharing knowledge to a potential recipient) and absorption (use) by that recipient. The transfer of knowledge is usually accompanied by a phase of knowledge application or practicing by the recipient. If the knowledge is not absorbed it has not been transferred.

KTs has been proclaimed as one of the most critical Knowledge Management (KM) activities in the current information age where organizations have to continually learn and continually innovate to remain competitive

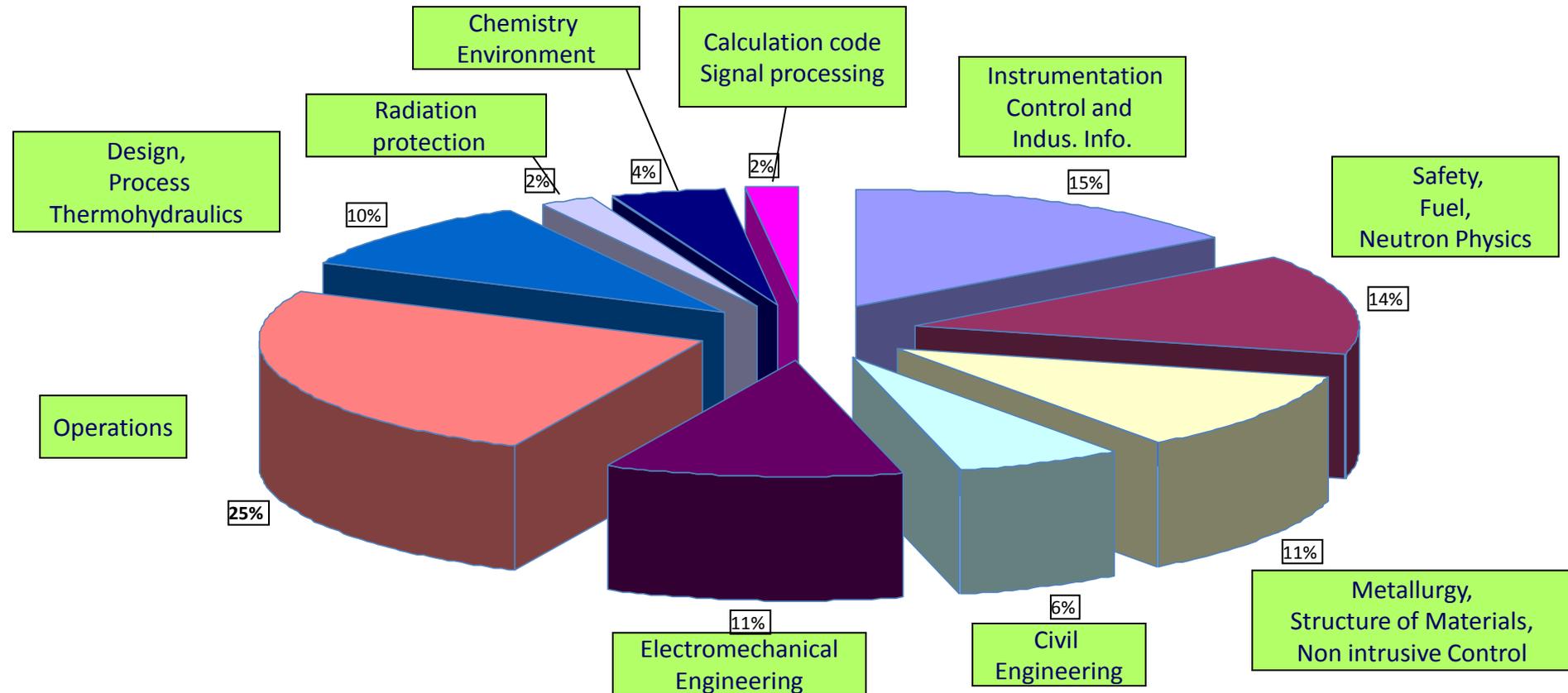
**In the nuclear industry Knowledge is in the heart of Safety.**

# High priority nuclear knowledge to be transferred

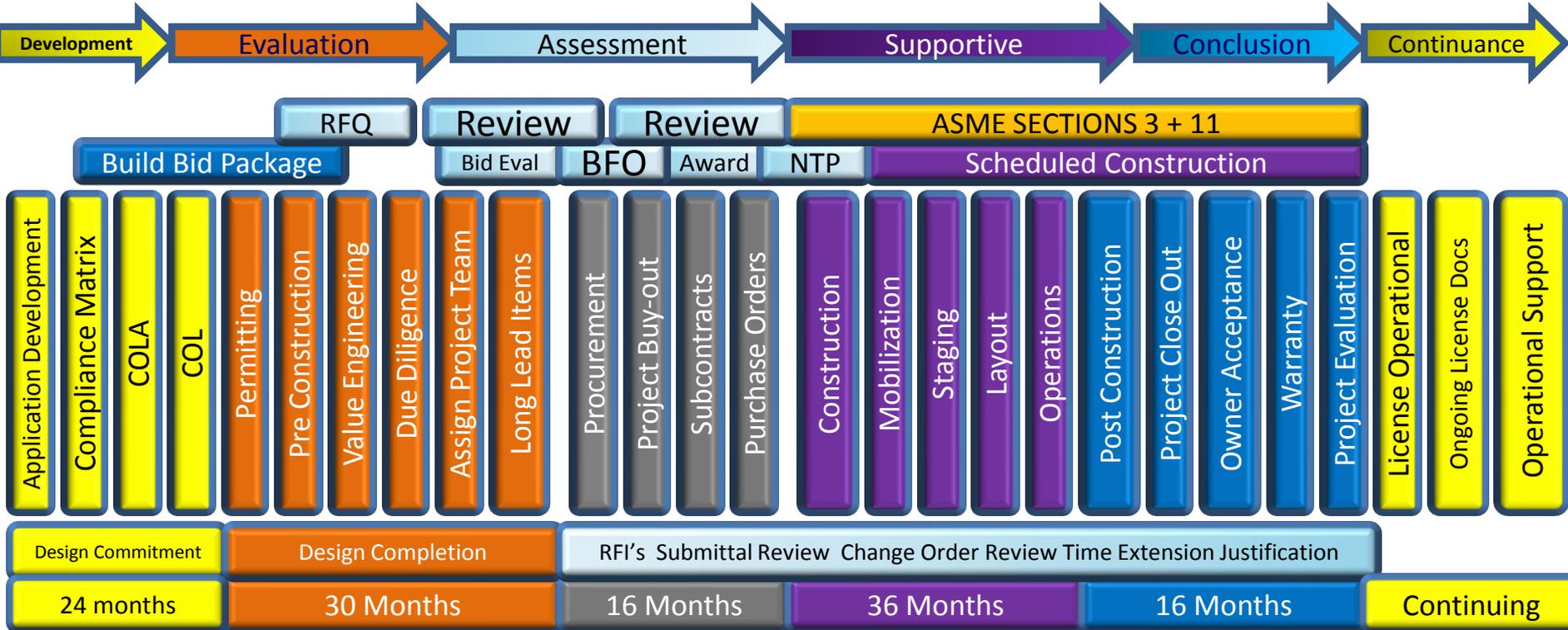
1. Academic (Science) and Practical (Technology) Knowledge.
2. Competence and Experience ( Operation)
3. Culture and Attitude



# Academic and Practical?



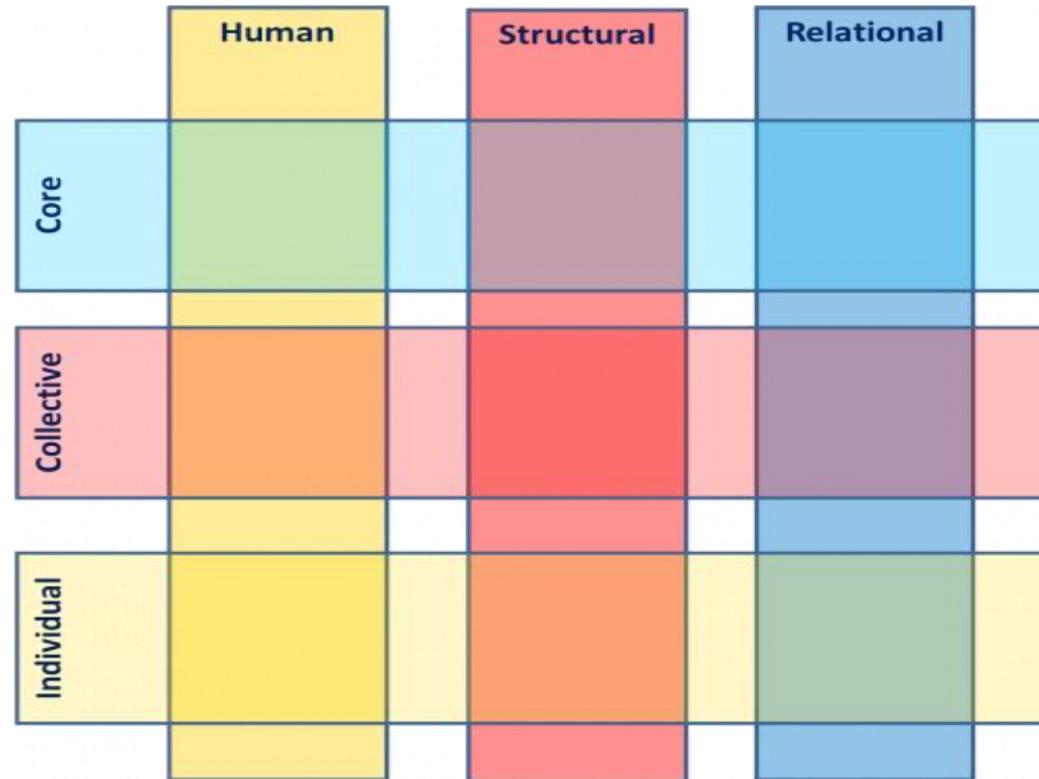
# Knowledge from Construction



## Construction Oversight Knowledge Management for new build NPPs

# Organisational competence

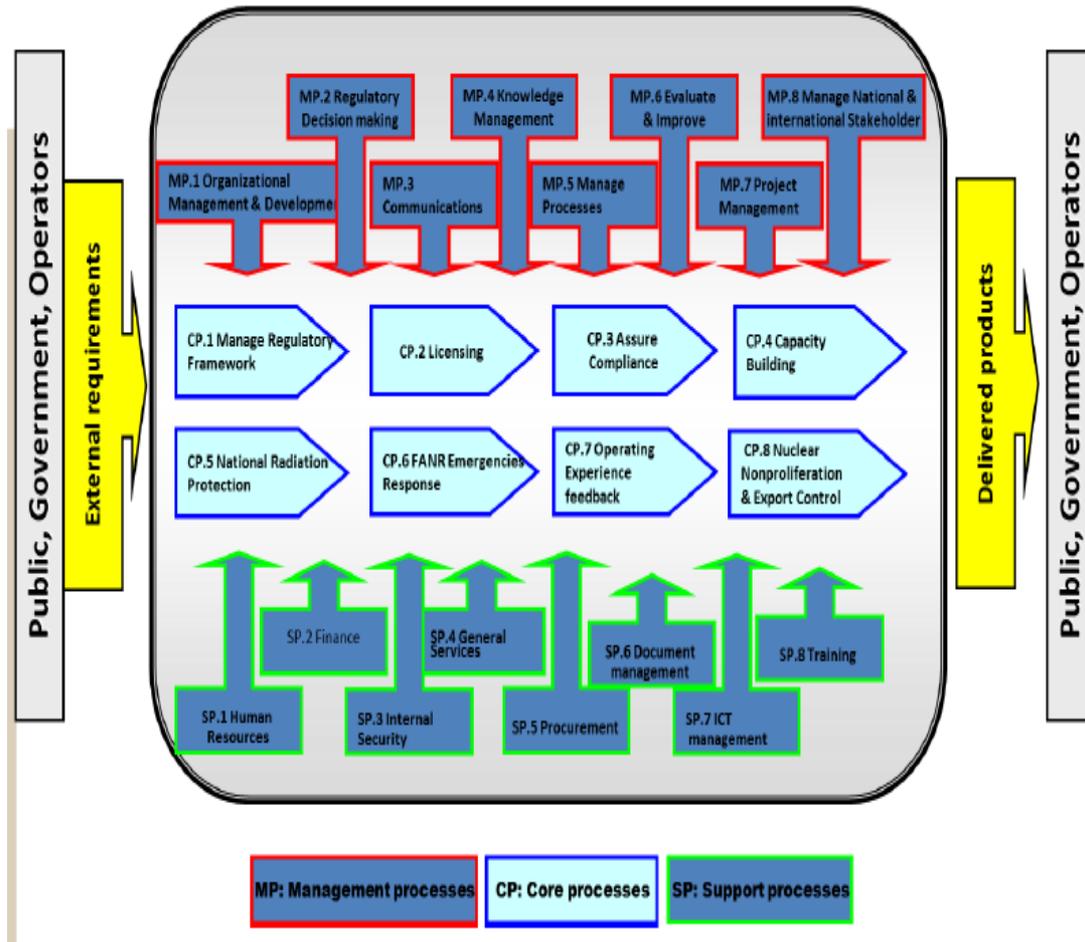
- The ability of the organisation to meet its objectives effectively and efficiently through the interaction of
  - people having the appropriate knowledge and skills,
  - processes, procedures, systems and technology
  - behaviours and culture,



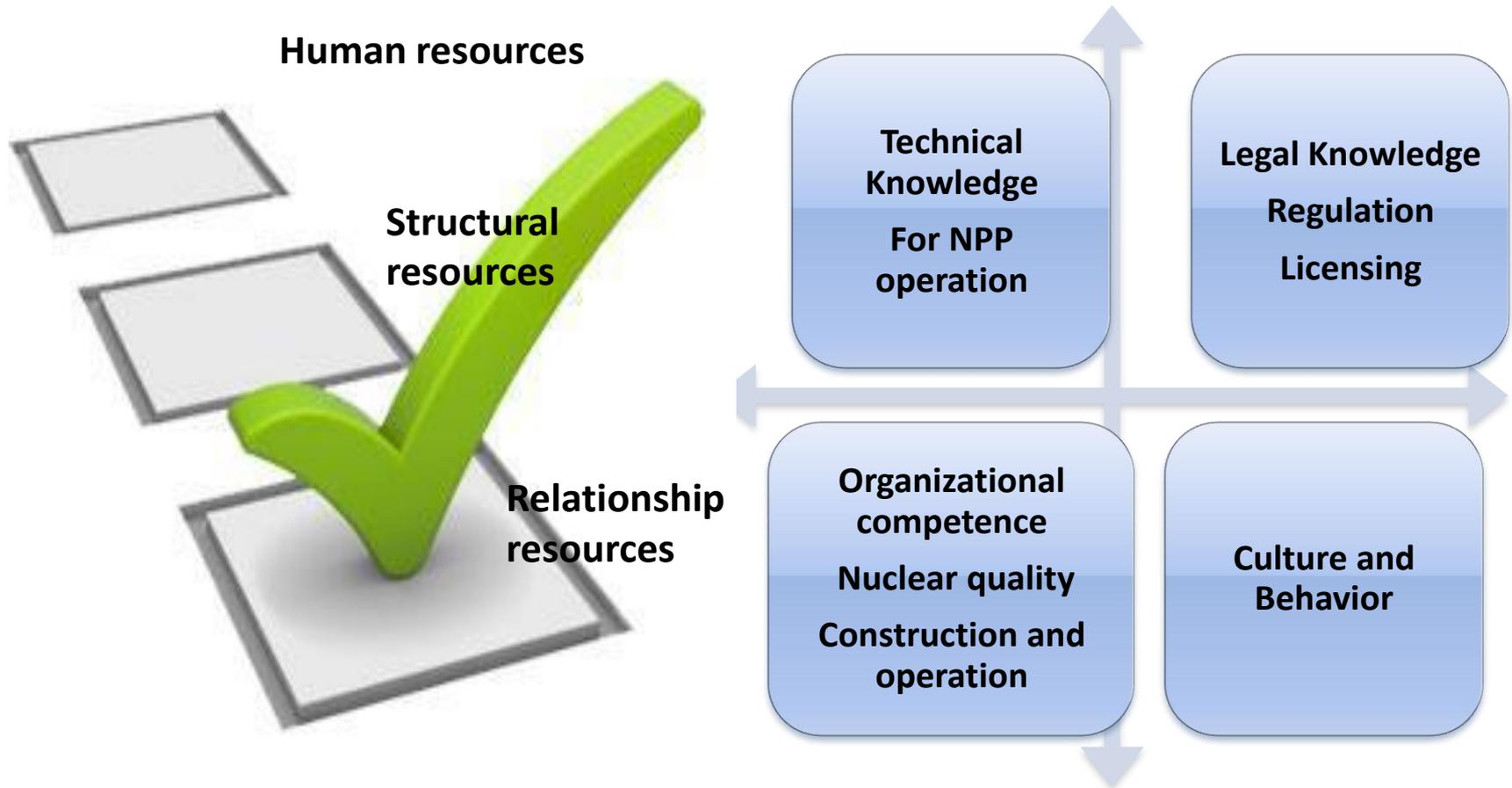
Knowledge resources

# Knowledge is planted in the Management System

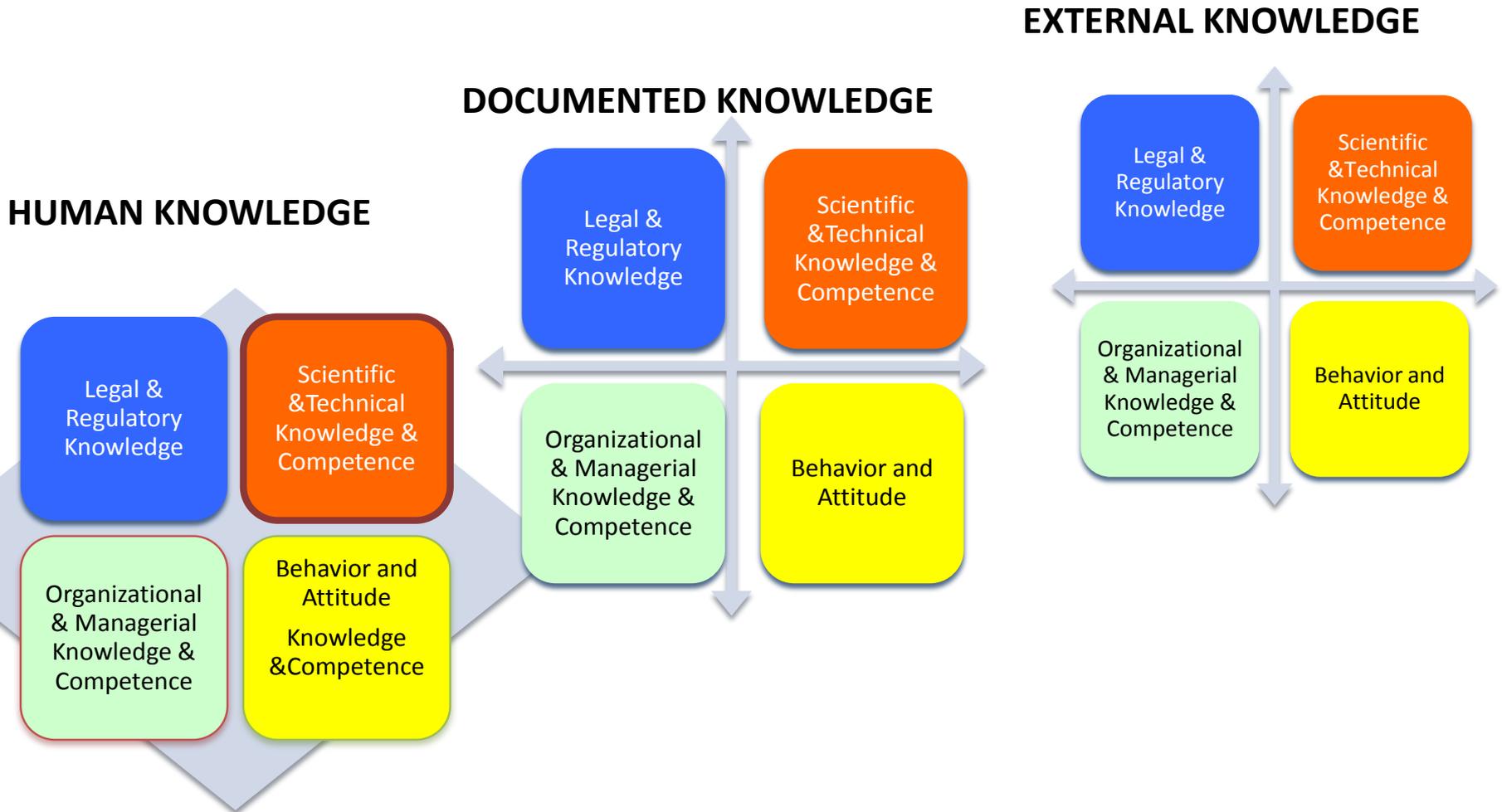
An effective and sustainable management system at a nuclear facility integrates such issues as safety, security, safeguards, health and quality, to ensure that strategic decision making does not take place in isolation.



# The Knowledge Resources



# Knowledge Matrix



# Major challenges

**Major challenges for sustainable nuclear energy which should be discussed include:**

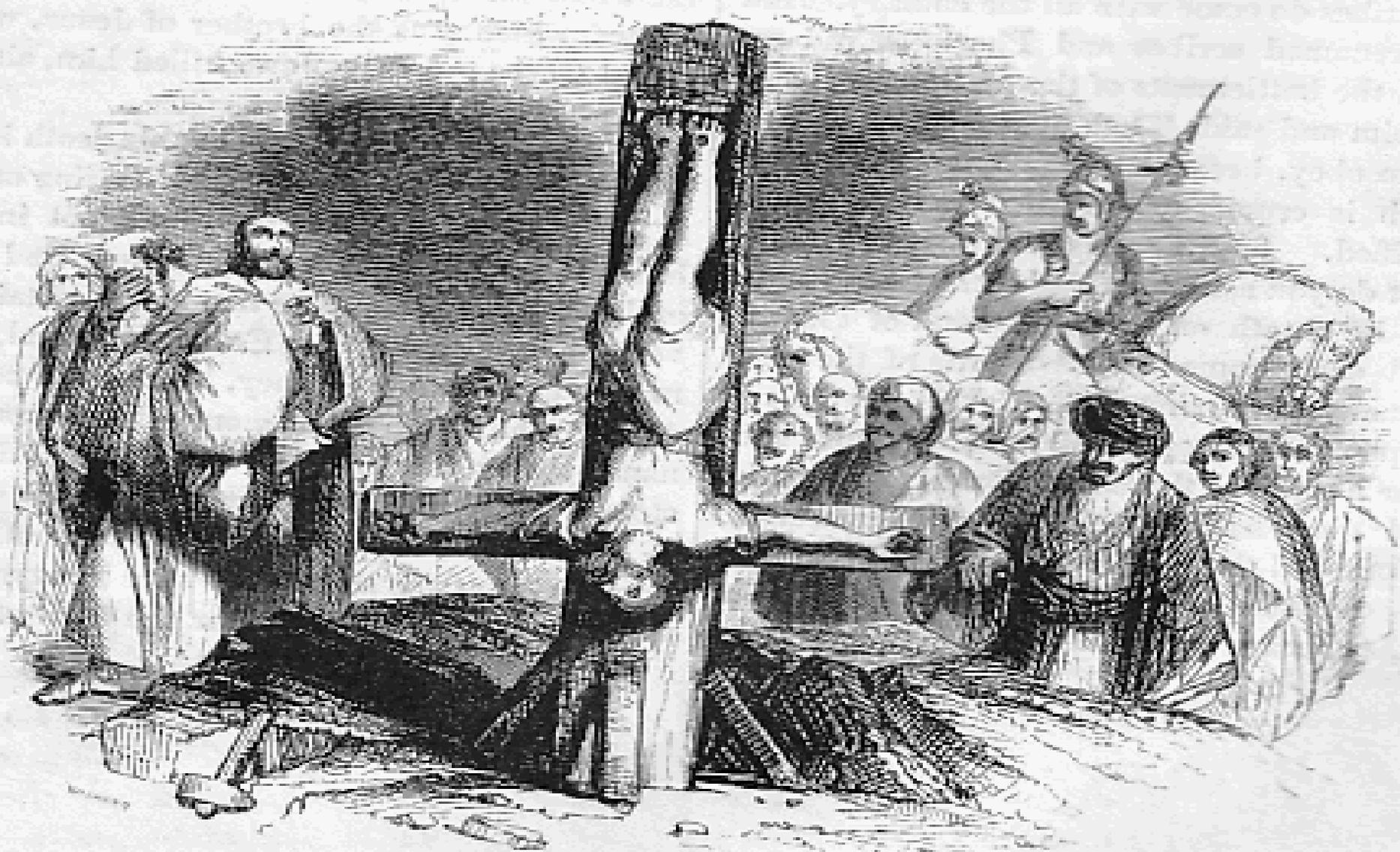
- **credibly valuing the attributes of nuclear energy (e.g., economics, environmental effect, public health, grid resilience) as part of a diverse energy production portfolio – at the intersection of public policy and the energy market.**
- **examining the priorities for supporting the current nuclear power fleet and the potential for advanced nuclear energy systems;**
- **the roles of government and the private sector in shaping nuclear energy's future;**
- **approaches to achieving sustainable leadership for nuclear energy in government and the private sector.**

# Some thoughts about newcomers

1. It takes at least 10 years to establish credible operational competence. **BE AWARE!**
2. Vendor should provide support for sufficient time for mentoring and transfer of knowledge and competence for operation and maintenance to a new NPP country.  
**ON WHICH BASIS?**
3. Vendor is the main resource for knowledge, expertise and safety culture. **HOW LONG?**
4. **What should be localised and what secured through long term relationship?**

# Epilogue

Not a single decision is last..



**БЛАГОДАРЯ ЗА  
ВНИМАНИЕТО**



**VINCC представляет и обеспечивает совместную работу ведущих международных экспертов, университетах, промышленно-технических и научных организациях, в области безопасности, создания и имплементация проектов в области мирного использования ядерной энергии.**