

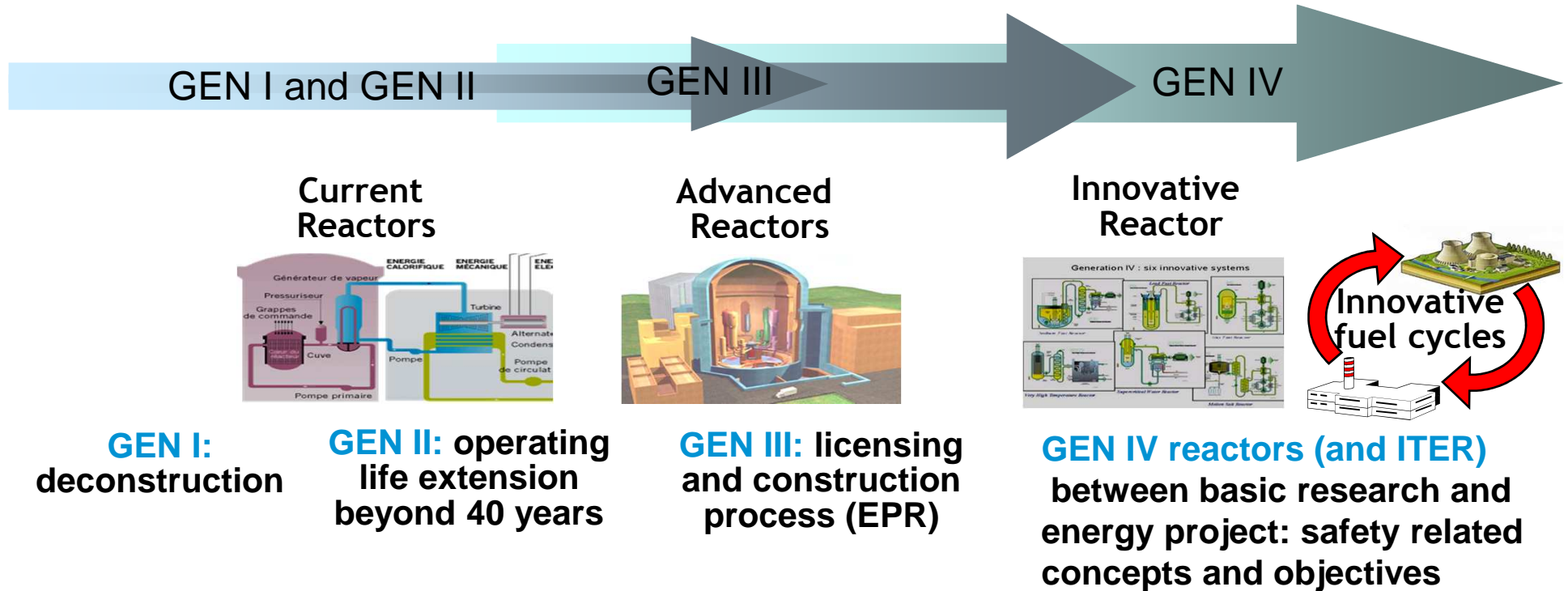
# IAEA International Conference Tokyo, Japan

## The role of the TSO's in performing nuclear safety and security research

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# Science and research : the driving forces for improvement of nuclear risks protection



- Technological developments performed by industry and major research operators.
- TSO's have to be in the same dynamics

# Nuclear safety: a science based activity

## ■ Three historical periods in the development of nuclear power

- Until TMI and Tchernobyl accidents: technology driven development, with relatively low regulatory controls
- Post TMI, until 2000: important public investment in safety oriented R&D, with large international programs
- Since 2000: emergence of the « independent safety authority » as a concept to improve control, and to gain public acceptance

## ■ Science towards a secondary role?

- New safety and radiation protection issues
  - Ageing, sophistication of system, human and organizational factors...
  - Individual radiosensitivity, non target effects, low-dose risks, environment etc...



# The role of TSO's in this context



- **Enhance nuclear safety knowledge**
  - Depository of technical and scientific knowledge addressed to regulatory
  - Identifying and addressing safety research needs and creating new knowledge
  - Identifying and addressing education and training needs
  
- **In order to enhance nuclear safety achievements**

# Parties involved in safety oriented R&D



## ■ Industry:

- Industrial development derived from a finalized research
- Research of relevant technological advance and commercial valorization

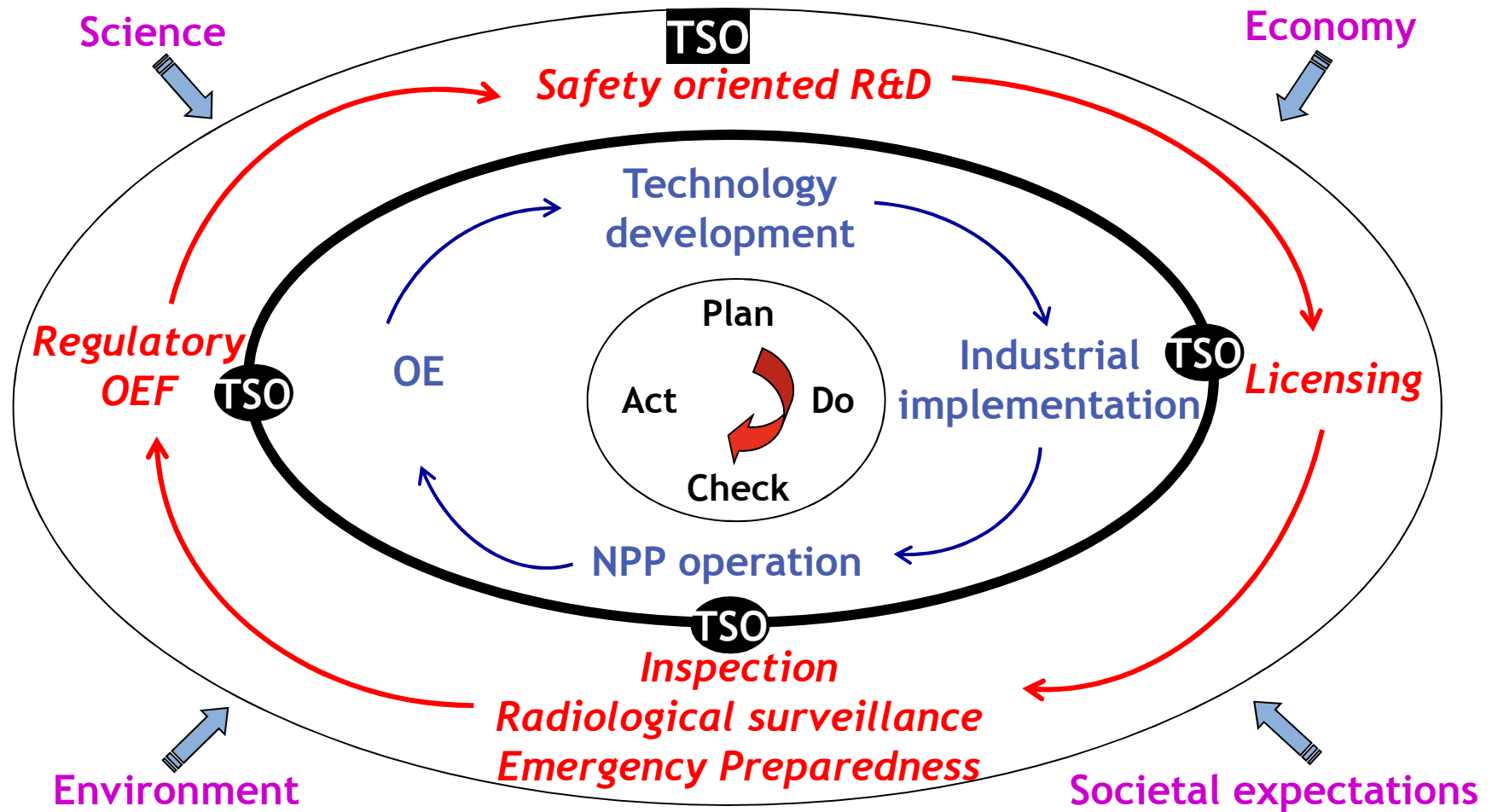
## ■ Academic research and main research operators:

- fundamental research to address innovation need
- Search for relevance regarding scientific and technical quality in each discipline

## ■ TSOs research:

- transversal finalized research to get means to assess the adequate safety performance level considering the up to date knowledge
- Search for relevance regarding grading of the risks and evaluation of the consequences

# Safety oriented R&D: a strategic, multidisciplinary challenge



# Function and responsibilities of TSO's

## ■ Develop, encourage and contribute to

- Research
  - Universities, Operators, Own
- Operating experience analysis ( feed back)

## ■ Support regulators

- Standards setting
- Standards implementation
- Incident/accident management

## ■ Make safety knowledge widely available

- Publications (NEA)
- Training (ENSTTI)
- Expertise capability

# How to organize safety oriented R&D ?

- Research must be well organized linked with a good management of time frame

- Define priorities, structure of topics and tasks

A vision without action is a dream, action without vision is a nightmare!

- Systematic coordination and gathering of the efforts for an efficient safety oriented R&D:

- R&D experimental infrastructures, Codes development and benchmarking, simulator type interfaces, PRA models

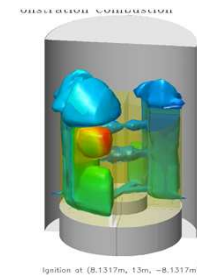
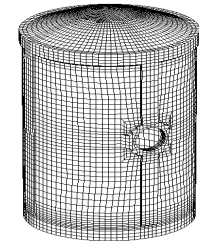
- Development of networking and technology platforms

- MELODI and DoReMi, SNETP, SARNET, GEN IV Forum, NEA, bilateral cooperation,



- IAEA and TSOs Conference of Aix-en-Provence April 2007 one main recommendation: research activities should be promoted within existing framework such as OECD/NEA

- CSNI projects development with a major participation of TSOs



Ignition of (8.1317m, 13m, -8.1317m)





# Values of TSO's

## ■ Priority to Safety knowledge

- Nuclear technologies and radioprotection: R&D Strategy
- Interface with the environment
- Human interfaces

## ■ Openness

- Transparency to stakeholders

## ■ Honesty

- Different from a conformity assessment

## ■ Independence of judgment

- Deontology
- Ability to support independent regulators

# Conclusion

## ■ TSO's have a central role in enhancing Safety

- By developing safety oriented R&D :Their knowledge has to be science-based and based on operating experience to be up to date
  - ✓ Conformity to standards are not enough to insure long term safety
  - ✓ TSO's are able to insure the technical interface with operators and regulators, and between them
- International cooperations
- Education, knowledge dissemination and transfer towards new countries entering the nuclear field.

## ■ TSO's enables regulators to be both

- Independent
- Competent

**The best time to plant a tree was 20 years ago.  
The next best time is now!**

**The best time for our TSO to perform nuclear safety and security research was 20 years ago.**

**The next best time to do it in common is now!**



**Thank you for your attention!**