

# THE REFURBISHMENT/UPGRADING DILEMMA

By Néstor Pedro DE LORENZO INVAP S. E. Argentina

> delorenzo@invap.com.ar www.invap.com.ar

### Current Projects at INVAP Involving Research Reactors



	Upgrading	1 MW – training & resea	rch
Const./Comm.		100 kW - training	
Detailed Design		30 MW - multipurpose	
Preliminary Design		30 MW - multipurpose	
Concept	ual Design	10 MW - production	

There are few upgrading/refurbishment projects compared with the large number of related inquiries received by INVAP.

They often involve:

- Intermediation through IAEA
- Poorly prepared business plans
- Biased approach to the real problems
- Incomplete identification of stakeholders

#### Identifying needs

- Compliance with present safety and security standards
- Obsolescence and ageing
- New roles and niches at local and regional scale

#### Shaping the modifications

- Definition of refurbishment or upgrade
- Definition of required performance
- Identification of reference designs or modifications performed in similar facilities

- Project launching
  - Nomination of Project Team
  - Drafting of Business Plan
  - Identification of current and potential Stakeholders
  - Identification of potential Contractors/Suppliers
- Initial implementation
  - Assessment of status of non-replaceable components
  - Definition of core conceptual design
  - Definition of fuel type and reflector
  - Definition of power range

#### Contributors to cost assessment

- EPC (contractor/supplier)
- Service disruption
- Dismantling and preparatory activities
- Licensing
- Staff preparation: incorporation, training, accreditation
- Future operation costs and their influence on the business plan

#### Implementation

- Procuring/manufacturing new equipment
- Defueling and clean up
- Removal and disposition of old SSC
- Installation and preoperational tests
- Staff training and accreditation
- Commissioning and return to routine operation



INI/AP







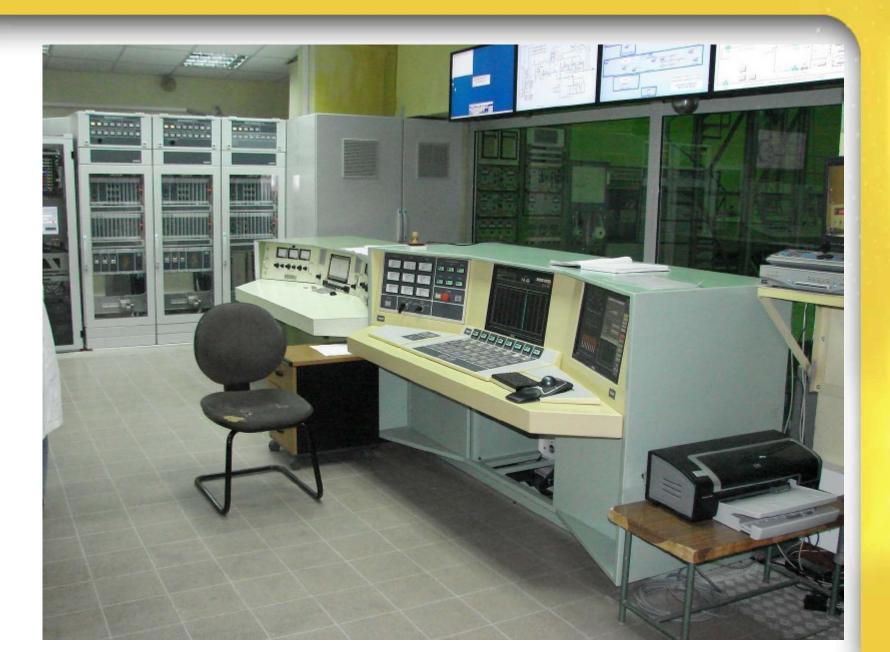






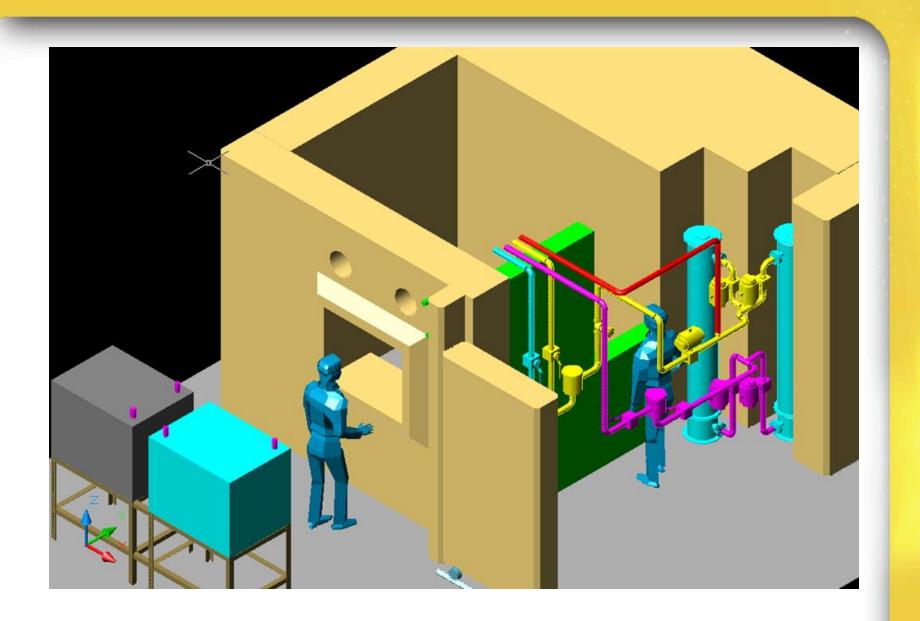






### **Facilities**





## **Facilities**



