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Industrial Involvement Major elements: (2) Establishing Industrial Involvement Policy

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Elements for successful Industrial involvement

Receiving countries need to develop/prepare/conduct;

- ❑ Capacity surveys of local industries
- ❑ Policies for developing industrial capacity
- ❑ Industrial standards & quality assurance mechanisms
- ❑ Capacity building activities such as:
  - ✓ National R&D programme
  - ✓ Partnership w/ competent players for technology transfer
  - ✓ Long-term and low-interest loan for capital investment
- ❑ National/Local investment for the above activities
- ❑ Negotiation with vendor and/or EPC contractor

Industrial Involvement Policies to be developed based on the result of Pre-F/S (typically in phase 1-2)

- Objective: Enhance local capabilities efficiently for NPP(s).
- A set of policy tools may involve
  - ✓ **National Plan** to introduce the NPP(s) in long-term
  - ✓ **Policy Goal** (e.g. localization rate, technical achievement)
  - ✓ **Subsidies** for R&D, capital investment, HRD, etc
  - ✓ **Tax Merit** for capital investment, import of equipment, etc
  - ✓ **Government Finance** (e.g. low-interest & long-term loan)
  - ✓ **Laws & Regulations** (on matters like technology transfer, foreign stakeholders' investment or ownership)
- There is no silver bullet; depending on the contexts such as local industrial background, global market trend, etc.

Tips for successful Industrial Involvement Policies

- Industrial involvement policy/strategy should take into account the whole life-cycle of the NPPs. ⇒ a long term strategy helps to involve in local companies more.
- The government & NEPIO should commit to the nuclear industry: let's study good/bad practices in other Member States… (e.g. South Korea, Poland, UK)
- Policy resource is always limited… but you may take from outside (e.g. export credit from vendor countries)
- Internal/international dialogues contribute to prioritize policy options you can take. Better to hear from industry-side and other stakeholders.

Case Study: 1960-70s, Japan

Name of NPP	Tsuruga Unit 1 (1st Operated LWR)	Fukushima Unit 1 (3rd Operated LWR)	Shimane Unit 1 (5th Operated, and 1st "Localized" LWR)
Main Contractor	GE	GE	Hitachi
Capacity (Net)	341 MWe	439 MWe	439 MWe
Ratio of Domestic Production	55%	56%	94%
Start of Construction	1966	1967	1970
Start of Operation	1970	1971	1974
Supplier of Reactor System	GE	GE	Hitachi
Supplier of Steam System	GE	GE	Hitachi
Supplier of Turbine System	GE / Toshiba	GE	Hitachi

Source: JAIF "World Nuclear Power Plant" (2017), et al.

Case Study: 1960-70s, Japan

1) Industry

- Technology Matured in Hydroelectric Power since 1940s
- Experienced in Gas Turbine (Alliance of GE & Hitachi signed 1953)
- Catch-up as a Subcontractor under the Licensing Contract
- Structured Supply-chain (366 companies involved in NPP in 1972)

2) **Utility** (Owner & Operator)

- Led R&D Projects w/ Domestic Manufacturers for Localization
- Well-Judged in the 1st Localized NPP (e.g. Chose Conventional Type of Reactors; Classified Components for Localization*)

* Utility decided to import hi-spec components such as I&C, Circulation Pumps, Control Rods

Case Study: 1960-70s, Japan

3) Government

- **National Plan** (1st Long-term Plan in 1956) based on Pre-F/S
- "Atomic Energy Commission" (≒NEPIO) established in 1956
- Joined in IAEA in 1957 (at the same time of establishment)
- **Subsidy** for R&D ($0.9M in 1967FY, mainly for Manufacturers)
- **Finance**
  - ✓ Long-term & Low-Interest Loan by Japan Development Bank
  - ✓ Export Credit Finance by US Exim Bank
- **Tax Benefit**
  - ✓ Exemption from Tariff
  - ✓ Special Depreciation

"Japan Power Demonstration Reactor"
(BWR provided by GE, operated for 1963-1976)

Case Study: 1960-70s, Japan

4) Market-wise (External Factors)

- **In the Early Stage of the NPP Technology**
  - ✓ Dawn of “Generation II” Reactors
  - ✓ Favorable “Buyer’s Market” ⇒ Room to Negotiate
  - ✓ US Vendors (WH, GE) were positive for TT
  - ✓ Not Yet Experienced TMI, Chernobyl, Fukushima

- **In the Period of High Economic Growth**
  - ✓ High Demand for Electricity
  - ✓ Lack of Domestic Energy Resources

“Shimane” Unit 1
(At the time under Construction)

Lessons Learned from the case

- What are more appropriate policies? ⇒ The answer(s) would depend on three factors: 1) Industry, 2) Utility, 3) Intl' Market.
- "National Surveys on Industrial Capacity" can be powerful evidence for establishing Industrial Involvement policies.
- Each stakeholder has each viewpoint (e.g. the government knows policy-making process, industry knows needs for policy support, while utility knows technology gaps in site).
- So, formal/informal dialogues among different stakeholders are significant to draft a set of effective policies.
- "Policy-wise" lessons learned may come from other fields (e.g. non-NPP power industry). Study your industrial history.

Thank you!

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