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Supply chain and QA issues – Lessons Learned

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The required efforts to face a new important challenge is similar to climbing a mountain shrouded in clouds. We cannot describe its top or be certain that there may not be unforeseen and perhaps insurmountable obstacles on the way. But we must be prepared to undertake the journey in the belief that the summit will never come into view unless we begin the ascent and deal with the initial difficulties immediately before us.

US Senator Sam Nunn
US Former Secretary of State Henry Kissinger

NYT, 7 July 2009

Supply chain management and control



1. Key for a correct on the budget and time schedule project implementation.
2. Paramount to have local inspectors and presence in the key phases of construction
3. Ideal would be to have a Process based Management System to oversight all important activities.

SUPPLY CHAIN MANAGEMENT



AN INTERNATIONAL EXPERIENCE

Equipment/Process	Supplier
Moisture Separator Reheater	Thermal Engineering International (USA) + Swecomex (Mexico)
Condenser	Yuba Heat Transfer, LLC (USA)
Titanium Tubes	Valtimet INC (USA)
Feedwater Heaters	Swecomex (Mexico)
Field bus system	Emerson (USA)
Turbine-generator	Alstom (EU, Mexico)
Transformers	IEM (Mexico)
Valves	CCI (USA) + Massoneilan (USA) + Ringo Válvulas (EU)
Cranes	Demag-Hormiga (EU, Mexico)
Isolated Bus Bar	Powergear (India)
Condenser Cleaning system	Technos (EU)
HVAC	Llorpic Ventiladores (EU)
Generator Switch breaker	ABB (EU)
Pipes	US METALS INC (USA)
Condensate and Booster Pumps	Flowserve (EU)

LESSONS LEARNED

1. Support Vendor !!!. Vendor limited experience on nuclear QA/QC requirements.
2. Clear definitions and contractual terms on purchase orders required, it is necessary clear specifications, delivery date, scope and contact person.
3. Contact person must be on facilities where the equipment is being manufactured. QA/QC personnel on Vendor facilities
4. Suppliers must be qualified to properly evaluate real capacity of their facilities and ability to solve problems or attend requirements of customer or regulatory authority.

LESSONS LEARNED

5. Suppliers supply chain becomes critical to know all sub-supplier and be able to access their facilities.
6. Clear and prompt communications between departments not located in the same country.
7. Define realistic delivery times.
8. Do in all cases kick-off meetings.
9. Do periodic meetings to know about status of supply, drawings, procurement, manufacturing.

LESSONS LEARNED

10. Choose if possible local suppliers to avoid long transportation times. *“We buy where we build”* principle

10.1 Difficult transport for heavy equipment (rotor, stator...) by sea because of availability of cranes in port for unloading.

10.2 Difficult transport by plane of equipment about weight and length.

11. Force Majeure situations:

11.1 Ash Cloud over Northern Europe

11.2 H1-N1 Flu

11.3 Rainy season in the Gulf of Mexico

12. Be aware of customs.

LESSONS LEARNED

13. Procedures and protocols shall be in place for the purchasing of the components, supplies and services of the nuclear facility to ensure the conformity and validity of purchased products.
14. Establish Preferential Suppliers for critical equipment and components.
15. Define a list of reliable supplier, because the impact caused by one delay or bad supply for the project is much greater than the cost of the equipment.
16. The detailed design should be mature. Design changes cause lots of hardware modifications and sometimes not possible to be done on the field

LESSONS LEARNED :

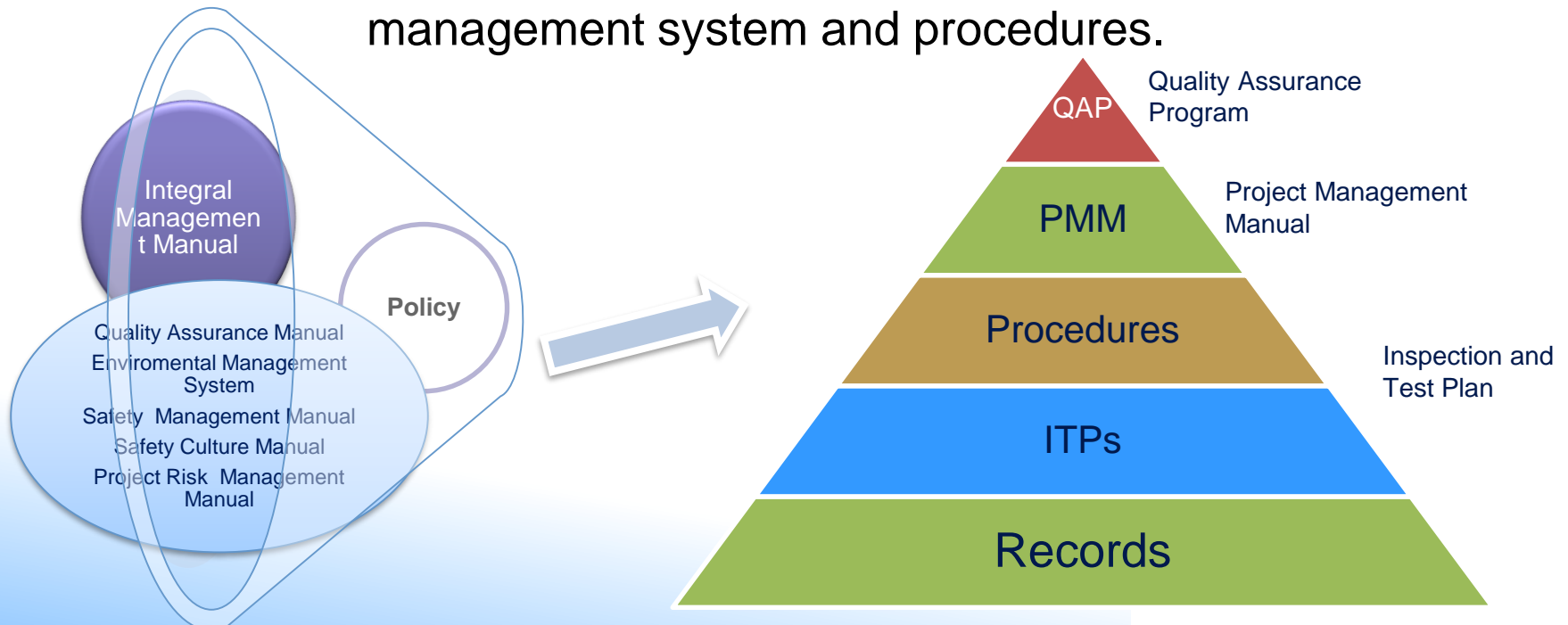
17. Procedures and protocols shall be in place for the purchasing of the components, supplies and services of the nuclear facility to ensure the conformity and validity of purchased products.

18. New technical and complex technical requirements requires continuous supervision in the manufacturer's shops

19. The vast majority of the previous nuclear qualified shops lost their nuclear stamps or certification. A complex Quality management process had to be developed to face the challenge to supply to the project.

Supply Chain Methodology: Project Management

- An Integrated Management System for the project must clearly include following concepts for procurement:
 - » Safety culture
 - » Purchasing process requirements and quality requirements for products and selection of suppliers, according to licence guidelines
 - » Continual improvement of the process based management system and procedures.



Supply Chain Methodology: Nuclear Newcomers

A comprehensive supply chain control comprises a complete overview of the project, including a fully Integrated Process based Management System, encompassing Engineering, Licence, QA & QC and Procurement Processes to ensure schedule compliance and project risk minimization.

It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.



Quote attributed to Charles Darwin



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Thank you!

