

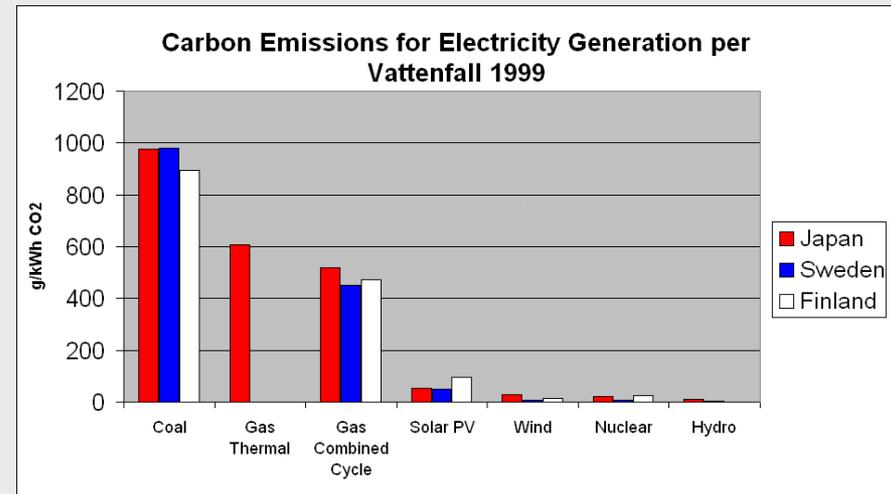
**PLANNING FOR A NATIONAL LOW-
LEVEL RADIOACTIVE WASTE
STORAGE & DISPOSAL FACILITY**

- LAS/ANS 2010 SYMPOSIUM -

JUNE 21 – 25, 2010

Background

- Current expansion of the world's nuclear power is driven by a very low carbon footprint associated with clean nuclear technology.
- The graph provides electric power generation technologies comparison versus carbon emissions



(source: "Pathways to a Low-Carbon Economy",
Vattenfall/McKinsey, 2009)

Background, Cont.

- As of April, 2010 public support for nuclear energy in the USA has reached a record high, with 74% of people saying they are in favor of nuclear energy.
- A poll conducted in late 2009 by TNS Sofres for Areva found that the majority of informed respondents supported the use of nuclear energy: France 82%, Germany 51%, Italy 62%, Spain 71%, Belgium 73%, UK 84% and USA 81%.

When asked were they worried about radioactive waste problems, informed public said yes as follows: France 49%, Germany 41%, Italy 49%, Spain 47%, Belgium 41%, UK 25% and USA 39%.

- Thus, although support for nuclear power is high, the public is concerned with storage and disposal of the resulting nuclear waste.

- Select a long-term safe, and cost effective technological approach to LLRW disposal.
- Select a facility design approach that will ensure safe removal of LLRW from the generator, its transportation, and disposal are environmentally sound.
- Select facility design that meets regulatory requirements and the public's expectations (**no human or environmental impact**).
- **Cover the Achilles Heel!**

- Discuss Low Level Radioactive Waste (LLRW) disposal facility development objectives
- Discuss URS “Safety Case Advocacy” approach to project execution and employment of best practices
- Discuss advantages of performing up-front planning studies early in the nuclear power expansion process – URS Baseline Study – Mexico
- Discuss current experience in the U.S.
- Discuss licensing and safety case advocacy benefits result when the public’s concerns are addressed early and with clarity.

Low Level Radioactive Waste (LLRW) Disposal Facility Development Objectives



- The primary objective of developing a LLRW disposal facility are:
 - select a long-term safe, and cost effective technological approach to LLRW disposal.
 - select a facility design approach that will ensure safe removal of LLRW from the generator, its transportation, and disposal are environmentally sound.
 - select facility design that meets regulatory requirements and citizens expectations (**no people or environmental impact**).

- URS “Safety Case Advocacy” is composed of three business cases
 - Persuasive Focus
 - Document Craftsmanship
 - Clarity of Presentation

URS “Safety Case Advocacy” – Persuasive Focus



- **Persuasive Focus** – The arguments presented in long-term safety cases must be centered on the key “proofs” required by statute and regulation.
 - For example, the demonstration that exposures and doses to inadvertent intruders at or near the disposal facility in the distant future will be below regulatory limits.
 - The licensing project team should have a clear vision of the key proofs required by statute and regulation.

URS “Safety Case Advocacy” – Document Craftsmanship



- **Document Craftsmanship** – There is no paint-by-the-numbers method.
 - Writing advocacy-oriented prose in safety-case contexts is hard, time-consuming craftwork.
 - Clearly articulated, advocacy-oriented safety reports instill Regulator and Public confidence in the safety cases they present, regulators are more apt to act on that confidence and grant licenses.

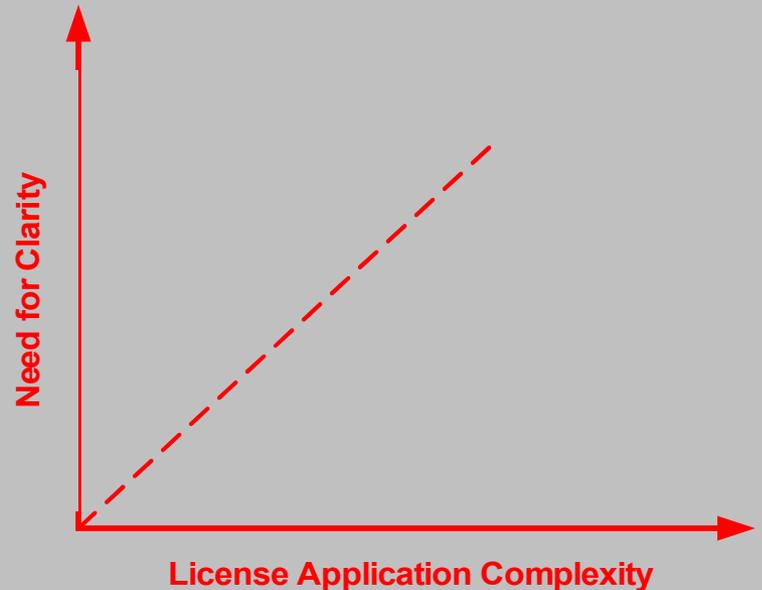
URS “Safety Case Advocacy” – Clarity of Presentation



- **Clarity of Presentation**

The quality and depth of the advocacy in a license application is also a function of the clarity with which the arguments are presented.

Figure 1
Relationship between license application complexity and need for clarity



- Purpose

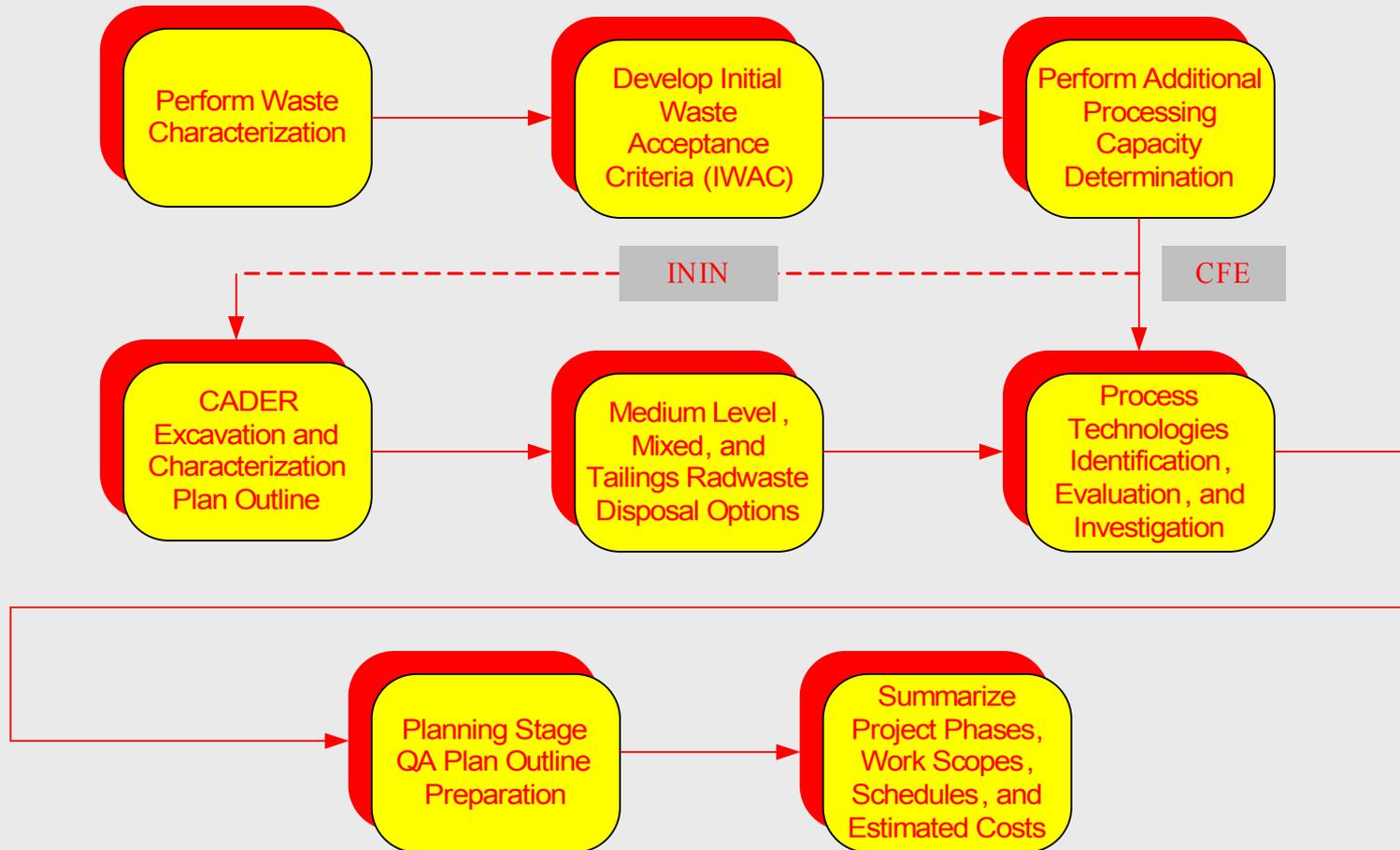
- Provide a baseline position to articulate a policy regarding radioactive waste management based on facts and considerations of public safety.
- Provide a broad discussion of the Country's LLRW management issues along with a clear projection of possible solutions.
- Provide insight into the range of quantities of types of LLRW produced, processing challenges, and the size of the facility required in Mexico.
- Provide input to NOM mandated Phase 1 (Planning Stage) requirements
- Identify budgetary funding level needed for the LLRW disposal facility.

NOM Phase 1 (Planning Stage) Requirements

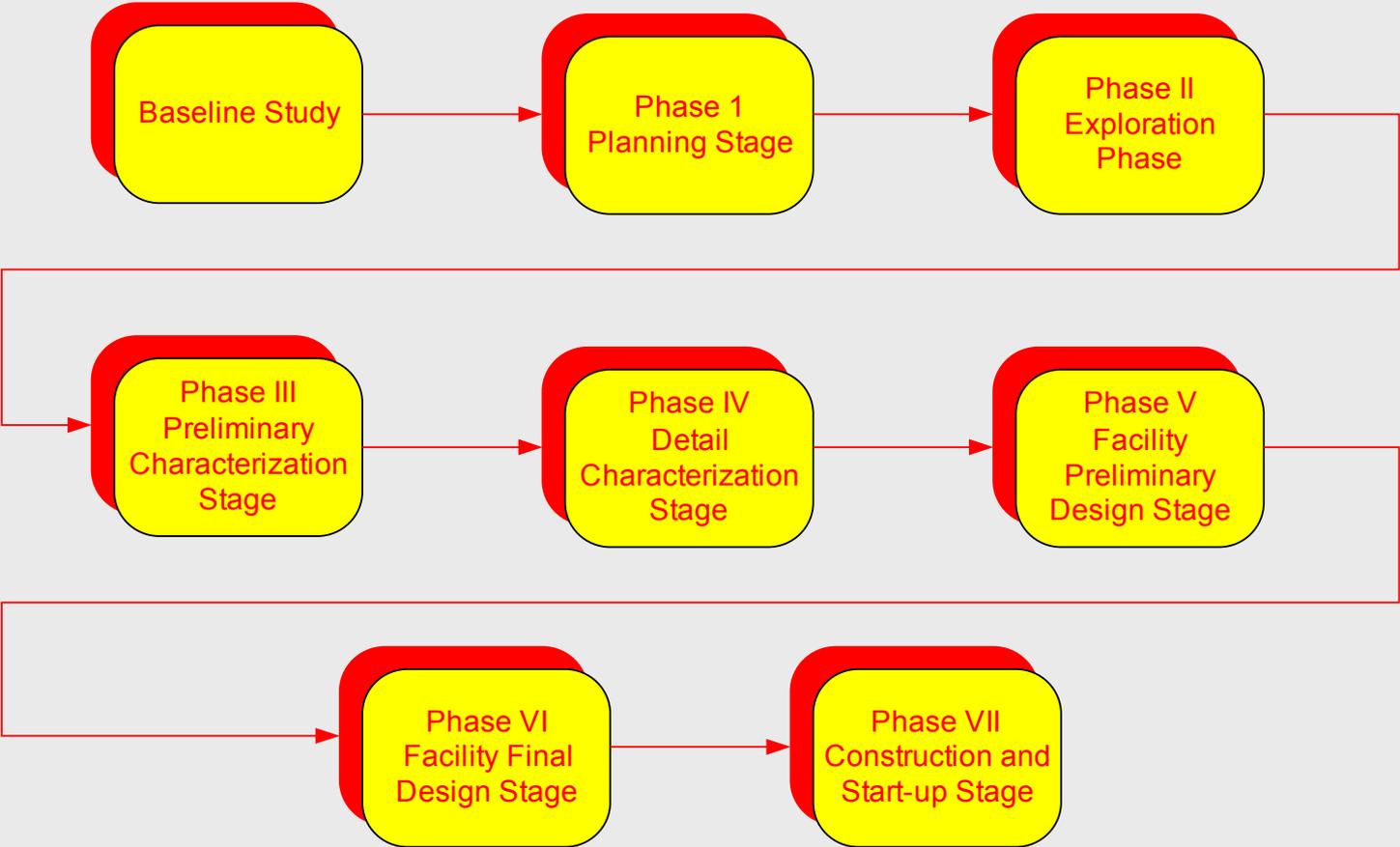


- Official Mexican Standard NOM-02/1-NUCL-1996
“Requirements for a Facility for the Permanent Storage of Low-Level Radioactive Wastes Near the Surface” – Planning Stage Requirements
 - The characteristics of the LLRW to be disposed must be identified
 - LLRW disposal facility conceptual design must be provided
 - The probable acceptance criteria needs to be provided
 - Projected budget and schedule needs to be provided
 - Desirable LLRW disposal facility characteristics need to be provided
 - Quality Assurance (Q A) Plan needs to be provided
 - Project Audit Plan needs to be provided

Baseline Study Tasks - Mexico



Overall Mexico LLRW Disposal Facility Project Projected Activities



Baseline Study Tasks – Mexico

Conclusions



- The LLRW disposal facility should be constructed in a modular approach. Two 2,000 cubic meter modules needed initially, 1) Class A and B LLRW and 2) Class C waste LLRW
- Additional waste processing equipment needed for LVNP and the other major LLRW generators to meet IWAC requirements
- Mixed wastes require special processing; proven process technologies are available to handle these wastes cost-effectively
- Approaches are available enabling Medium Level wastes to be disposed of in a LLRW Class C disposal module
- Disposal Program seven-phase budget and schedule

URS Project for LLRW Disposal Facility – Texas



- On September 10, 2009, the Executive Director of the Texas Commission on Environmental Quality (TCEQ) granted a license Class A, B and C wastes disposal to Waste Control Specialists LLC (WCS), Andrews County, Texas facility
- URS Role – Responsible for:
 - Overall license application integration (construction, operations, and closure),
 - Development of facility source terms,
 - Preparation of the facility performance assessment,
 - Development of operating and monitoring procedures, and
 - Development of operational and closure plans
 - URS used a graded approach to apply the requirements of its NQA-1 nuclear facility quality assurance program.

WCS LLRW Disposal Facility – Figure 1



WCS LLRW Disposal Facility – Figure 2



1. Access road to 1,338-acre fenced site (guarded entrance)
2. On-site rail spur and rail-unloading facility
3. Maintenance building
4. Administration building with analytical and radiological laboratories

5. Container Storage Building
6. Stabilization/ Mixed Waste Treatment
7. Bulk/Bin Storage Units
8. RCRA subtitle C landfill
9. Byproduct material landfill (proposed location)
10. Federal LLW/MLLW landfill (proposed location)
11. Texas Compact LLW landfill (proposed location)
12. Ten-acre storage area for low-specific-activity (LSA) waste

Advantages of Early Planning



- Dramatically improved licensing and safety case advocacy benefits
- PROACTIVE
 - Enabling characterization of expected wastes,
 - Establish early waste acceptance criteria for waste packaging and ultimate shipment to the disposal facility,
 - Provides ample time to locate the best national disposal site location considering technical and geopolitical criteria
 - Provides for ongoing program of public information
 - Facilitates shaping of public opinion by providing accurate and balanced information

- Early proactive LLRW disposal facility planning should be a priority for expanding nuclear power.
- Licensing and safety case advocacy benefits result that enhance public and licensing body acceptance.
- A Baseline Study is an excellent early planning tool that identifies regulatory and licensing requirements for the facility and lays out a “roadmap” for a cost-effective, phased approach, to facility development.



Any Questions?