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FCIX 2007
IAEA's Operational Safety Review Service for Fuel Facilities

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June 12-13, 2007

IAEA Operational Safety Reviews

- Nuclear Power Plants: Operational Safety Review Team (OSART)
  - 137 OSART missions completed
- Research Reactors: Integrated Safety Assessment of Research Reactors (INSARR)
  - 72 INSARR missions completed
- Fuel Cycle Facilities: Safety Evaluation During Operation (SEDO)
  - 1st SEDO mission was in Brazil April/May 2007

IAEA Operational Safety Reviews (cont'd)

Customers

Governments/Public

- Governments invite SEDO missions

Facility

- Receives safety recommendations
- Receives improved public acceptance

Industry/IAEA

- Receive information on safety recommendations and strengths of reviewed facility
- The results can influence IAEA documents

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SEDO Objectives

- **provide a comprehensive and objective assessment of key operational safety areas with respect to proven international safety performances and practices**
- **provide written recommendations where safety performance or practices should be improved**
- **identify best safety practices and encourage their use**

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SEDO Objectives (cont'd)

- broaden team's members and facility counterparts' experience and knowledge through informal exchange of information on safety related matters
- disseminate findings including best safety practices to all member states within the constraints of not releasing proprietary/sensitive information

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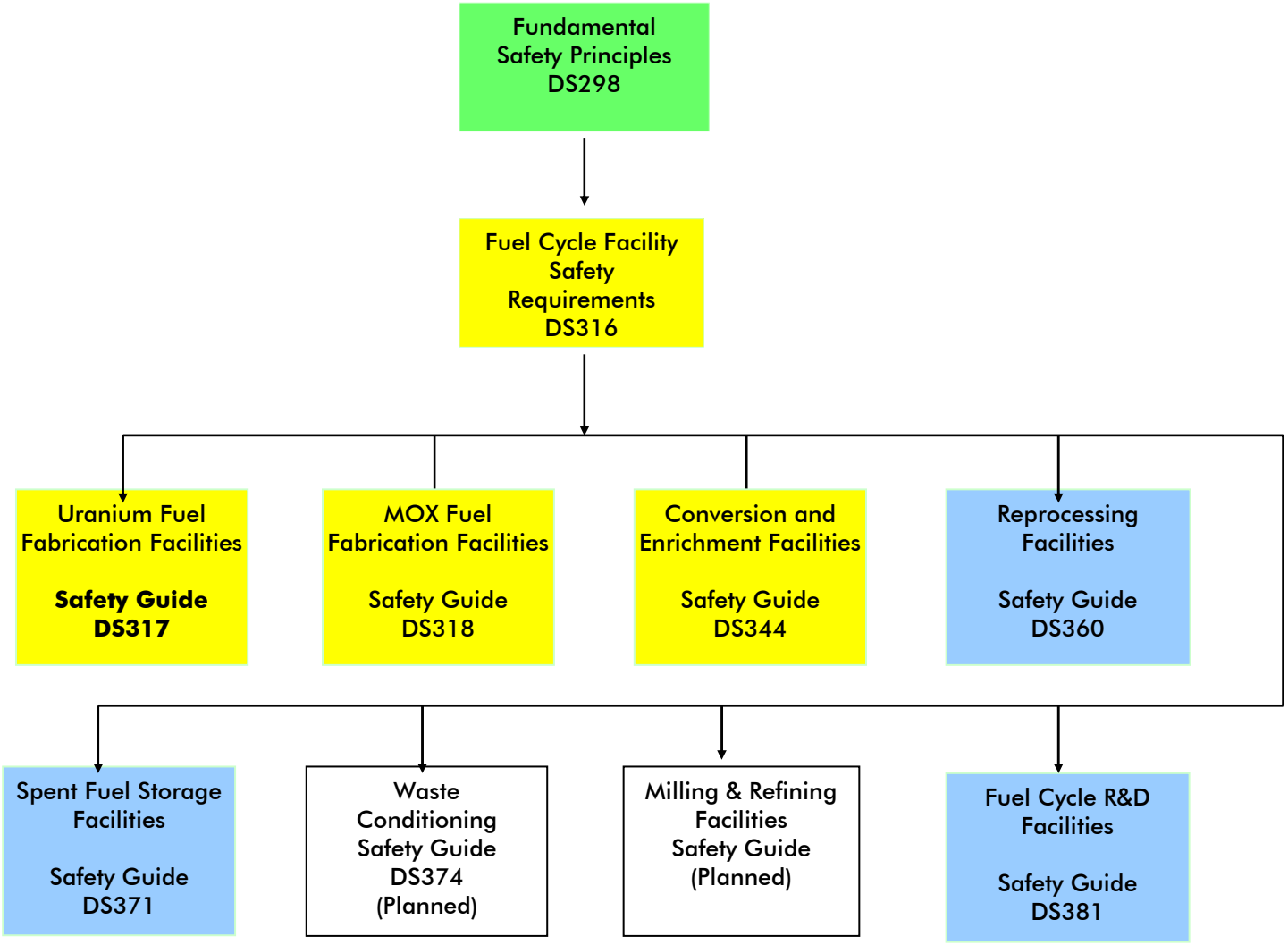
What SEDO is "NOT"

- A review of the regulatory authority or the national regulations
- A regulatory inspection or audit
- A facility design adequacy assessment
- An assessment of the facility's overall safety ranking

IAEA Standards



SEDO Guidelines

- Primarily derived from OSART and INSARR Guidelines
- Provide method for conducting a systematic review of the operational safety of fuel cycle facilities
- Developed by a group of experts with extensive fuel cycle experience

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Candidate SEDO Facilities

- Milling
- Conversion
- Enrichment
- U and MOX fuel fabrication
- Spent fuel storage
- Reprocessing
- Waste conditioning & storage
- Fuel cycle R&D

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Benefits

- **Motivate entire organization (including support organizations) by providing a common vision and purpose for ensuring a successful SEDO mission**
- **Encourage self assessments prior to the SEDO mission**
- **Use the SEDO mission as a means for obtaining a high quality and independent benchmark against IAEA standards**

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Challenges

Protection of proprietary and security information:

- Consensus on the scope of SEDO review and selection of SEDO reviewers based on qualification and independence
- Explicit confidentiality agreement signed by reviewers
- Authorization from the operating organization, if documents are to be taken or sent from the site
- Formal authorization from the host country and the operating organization to publish or place in a public database the SEDO report or safety findings and good practices

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Challenges (cont'd)

Diverse installations and limited pool of fuel cycle experts

- **SEDO review boundary clearly identified**
- **Size and level of expertise of review team based on the type and size of the facility**
- **Select independent and qualified reviewers from fuel cycle operators, nuclear power plant operators, research centers, regulators, etc.**

SEDO Review Process

- The IAEA conducts a 2-day preparation meeting with the operator and regulator 12 months prior to SEDO mission
- Operator provides Advance Information Package (AIP) 3 months prior to mission
- On the average, a SEDO mission will involve a12-day onsite review period
- Normally, a 5-day follow-up visit will be conducted 12-18 months after mission to review the safety improvements at the facility

SEDO Review Areas

1. ***Management, organization and administration (MOA)***
2. ***Training and qualification (TQ)***
3. ***Operations (OP)***
4. ***Maintenance and periodic tests (MPT)***
5. ***Modifications (MOD)***
6. Other technical support (TS)
7. ***Criticality safety (CS)***
8. ***Radiation protection (RP)***
9. Waste management & environmental protection (WMEP)
10. ***Industrial and chemical safety (ICS)***
11. Emergency planning and preparedness (EPP)

*** SEDO mission core areas in *bold italics***

SEDO Review

- Each SEDO team member is assigned to one or more review areas
- Each SEDO team member has a technical counterpart from the operating organization
- The SEDO team primarily uses the following steps to acquire information:
  - Review of written material
  - Interviews with personnel
  - Direct observation of status and activities
  - Discussion of tentative conclusions with other team members

SEDO Review (cont'd)

- Each SEDO reviewer collects facts during the day and discusses these in evening meeting with SEDO team
- After each evening meeting, each SEDO reviewer writes detailed Technical Notes on his/her observations and conclusions
- On completion of the review, a SEDO report is prepared
- This report is an official IAEA document

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SEDO Review (cont'd)

Host Facility Peer

Operating organization's senior staff member with good overall knowledge of facility operations and programs

- **participates in SEDO team meetings and activities**
- **advises the team when information may not be complete or correct**
- **advises the team of staff that can provide clarifications**
- **does not have any plant responsibilities during the SEDO onsite review period**

SEDO Review (cont'd)

Reviewer Counterpart

- Senior member whose area of plant responsibility corresponds to the SEDO area of review
- Same counterpart remains with reviewer throughout the review period
- Counterpart provides review coordination eg. calls in specialist staff as required
- Counterpart conducts joint search with reviewer for good practices, performance weaknesses and opportunities for improvement

SEDO Review (cont'd)

Regulator

- Participates in the entrance and exit meetings
- Does not participate in tours or discussions
- May be interviewed by team concerning relationship with the operating organization
- Briefed by SEDO Team Leader before exit meeting
- Receives draft report for comments
- Receives final report

SEDO Review (cont'd)

Some field review items:

- **Adequacy of facilities and their present status**
- **Condition of equipment and systems**
- **Cleanliness and preservation**
- **Existence and effective application of policies, programs and procedures by supervision and workers**

SEDO Review (cont'd)

Some field review items:

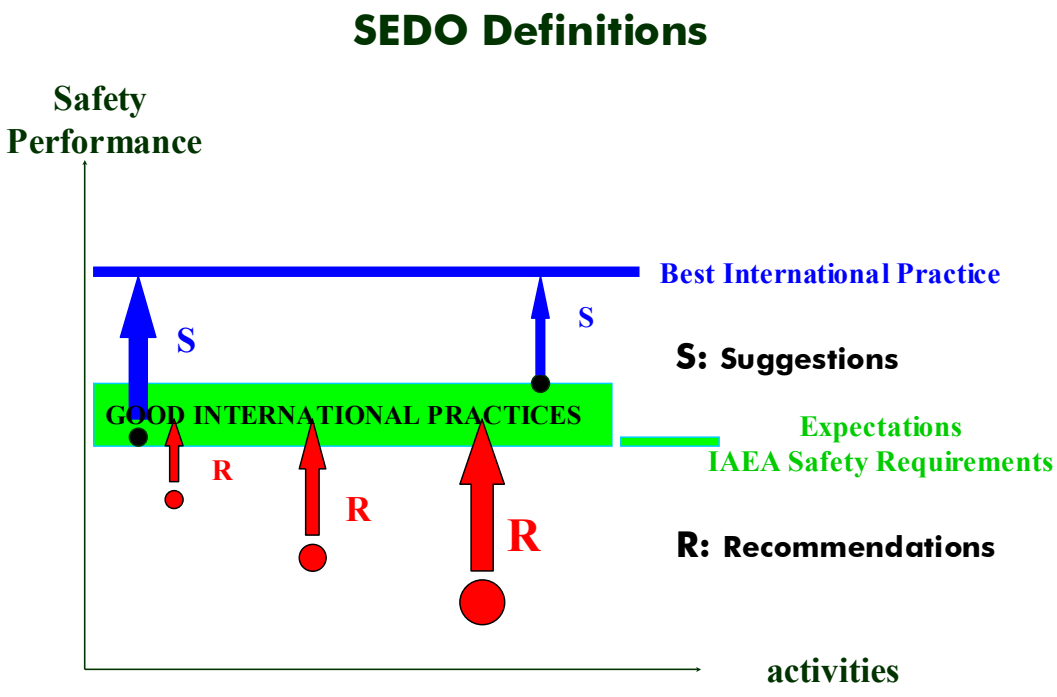
- **Attitudes, capabilities and performance of workers**
- **Attitudes, capabilities and performance of supervisors**
- **Amount of staff from operational organization present in the field and what they are doing**

SEDO Review (cont'd)

Some performance based issues:

- **Work activities/practices below internationally applied standards**
- **Events, incidents, near misses**
- **Human errors**
- **Unreliable equipment/equipment unavailability**
- **Poor material condition in the facility**
- **Poor housekeeping**
- **Ineffective use of procedures**
- **Missing, incomplete or deficient programs**

Recommendations vs Suggestions



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Recommendations

- **Advise on <u>WHAT</u> performance improvements in operational safety should be made, not <u>HOW</u>**
- **Based on and referenced to IAEA Safety Standards or proven, good international practice**
- **Addresses the underlying causes rather than the symptoms of the concern**
- **Often illustrates a proven method of striving for excellence, which reaches beyond minimum requirements**
- **Should be specific, realistic and result in tangible improvements**

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Suggestions

- Intended to make good performance more effective
- Indicates useful expansions to existing programs
- Points out possible superior alternatives to ongoing work
- Stimulates the plant management and staff for ways to enhance performance
- May stand on its own, or as an additional proposal in conjunction with a recommendation

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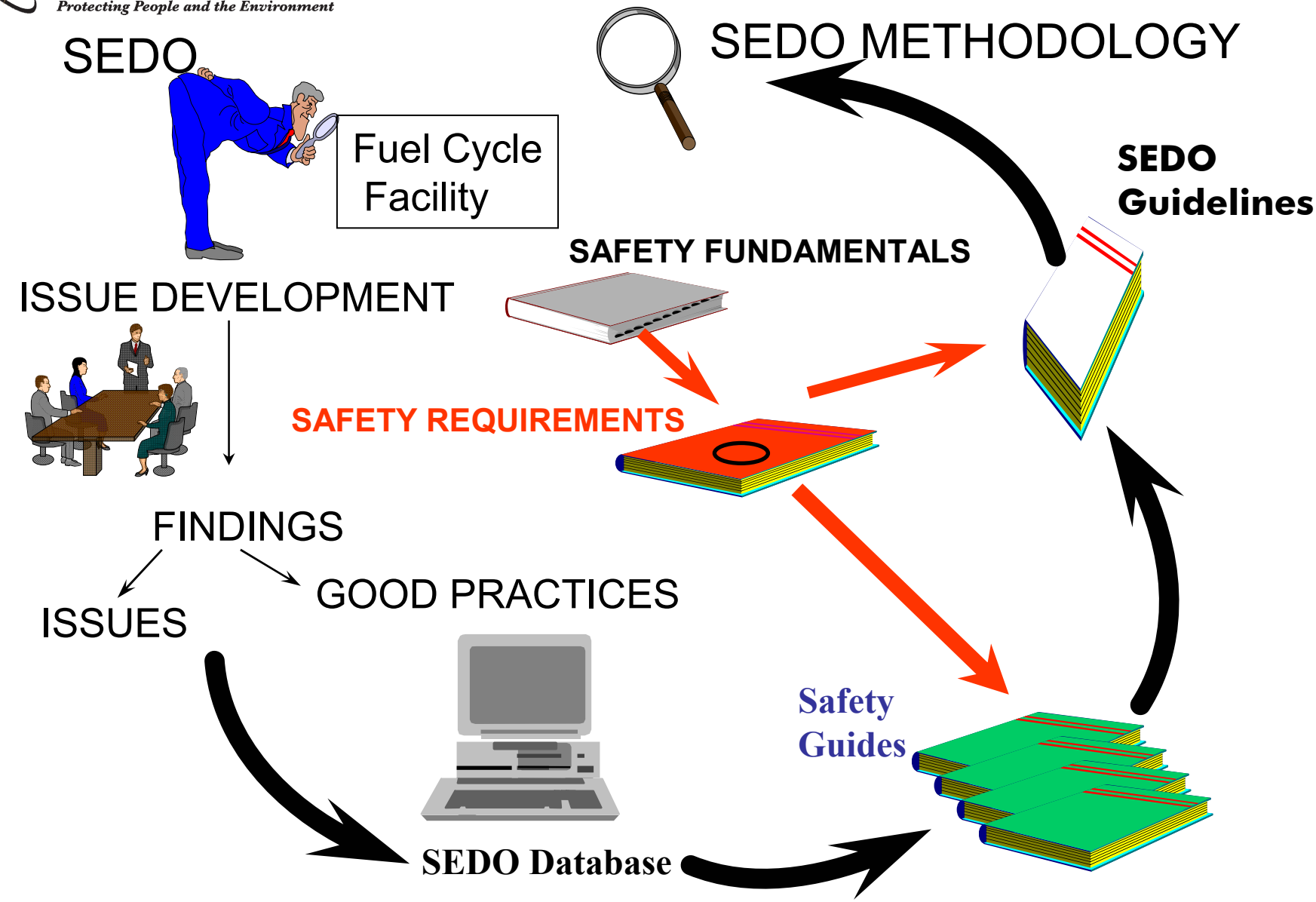
SEDO Report

- **The SEDO review report contains issues related to root causes that are supported by multiple facts:**
  - **Facts discussed with counterparts during review**
  - **Issues/Recommendations/Suggestions provided to operator prior to exit meeting**
  - **Draft 1 of the SEDO report officially provided to operator/regulator on day of the exit**
  - **Operator/regulator provide comments in 1 month**
  - **IAEA addresses comments 1 month later (Draft 2)**
  - **IAEA issues final report 1 month later**

SEDO/Standards interface



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