SAND2008-1988C

Transparency: Building Trust and Confidence on an International Level

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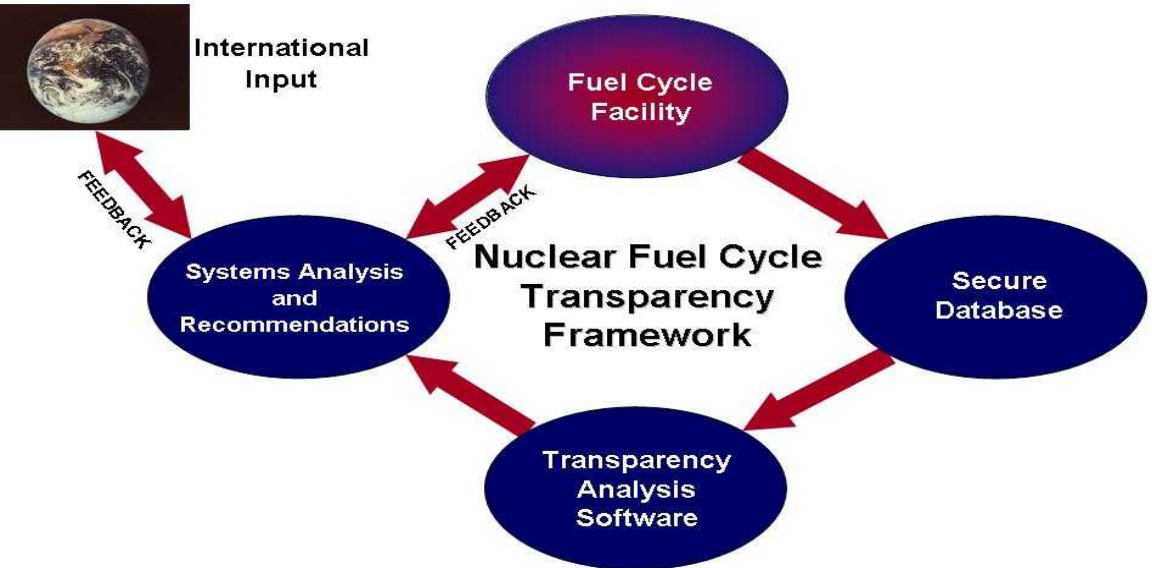
Outline

- Background
- Transparency and Safeguards
- Advanced Transparency Framework
- Design Principles
- Conclusions

Transparency is a confidence building approach among political entities to ensure civilian nuclear facilities are not being used for the development of nuclear weapons

Nuclear fuel cycle transparency involves the cooperative sharing of relevant nuclear material, process and facility information among all authorized parties to ensure the ***safe and legitimate*** use of nuclear material and technology

A system is transparent when all parties feel that the diversion risk is at an acceptable level. For this to occur, proliferation risk should be monitored in a continuous fashion.

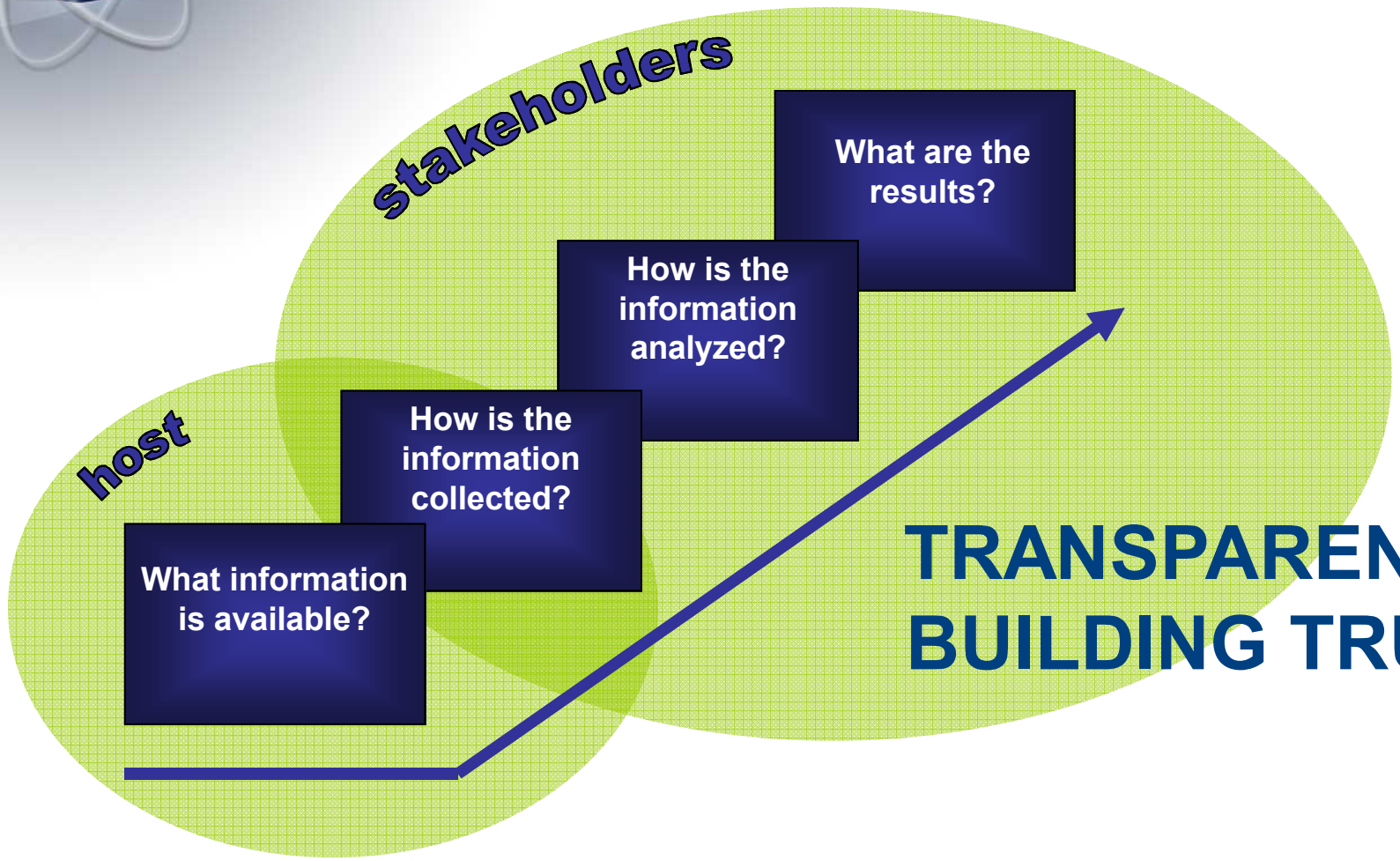


Key Terminology

- Host: the country operating nuclear technology
- Stakeholder: any party interested in the country's nuclear activities (i.e. general public, neighboring countries, international community)
- Transparent Relationship: an agreement between a host and a stakeholder to share all available information concerning a particular issue
- Negotiated Relationship: a relationship based on agreements to share limited sources of negotiated information regarding a particular issue
- Transparent Data: data that is shared within a transparent relationship but is protected from disclosure outside of the transparent relationship

Transparency: Building Trust and Confidence

- Trust and confidence is subjective to a stakeholder's interpretation of shared data
- A transparent relationship makes applicable facility information available to the stakeholder
  - The stakeholder must to protect transparent data
- A transparent relationship can focus their efforts to build confidence by releasing analysis results that address the target audience's concerns
- Transparency requires complete sharing of relevant information from all parties involved



TRANSPARENCY: BUILDING TRUST

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Transparency and Safeguards

- Transparency is not equivalent to IAEA safeguards

Safeguards:	Transparency:
•Designed to allow IAEA to verify declared operations	•Designed for building trust relationships among stakeholders
•Have been used historically as means to minimize proliferation opportunities	•Provides objective data to verify the integrity of facility operations
•Negotiated location of monitors and sources of information	•No negotiations. Requires full disclosure of relevant data to the chosen stakeholder/s on a particular issue

- Transparency – and Advanced Transparency – can provide a secure source of process data that may be used to further strengthen IAEA's safeguards efforts with regards to process monitoring
- For a transparent facility, safeguards become complementary

REDEFINING TRANSPARENCY

OLD

–Monitoring fuel handling activities by inspection

–Slow and subjective

NEW

–Increasingly automated fuel handling activities

–Use of process data

–Real-time quantitative analysis

A traditional transparency system involves:

- Use of external devices (i.e. video cameras)
- Subjective visual monitoring of activities
- Provides no feedback

An advanced transparency system MUST:

- Operate in real-time
- Utilize plant process and design data
- Utilize declared plant processes
- Conduct real-time, quantitative analysis of diversion risk
- Securely provide analysis to the facility and authorized parties

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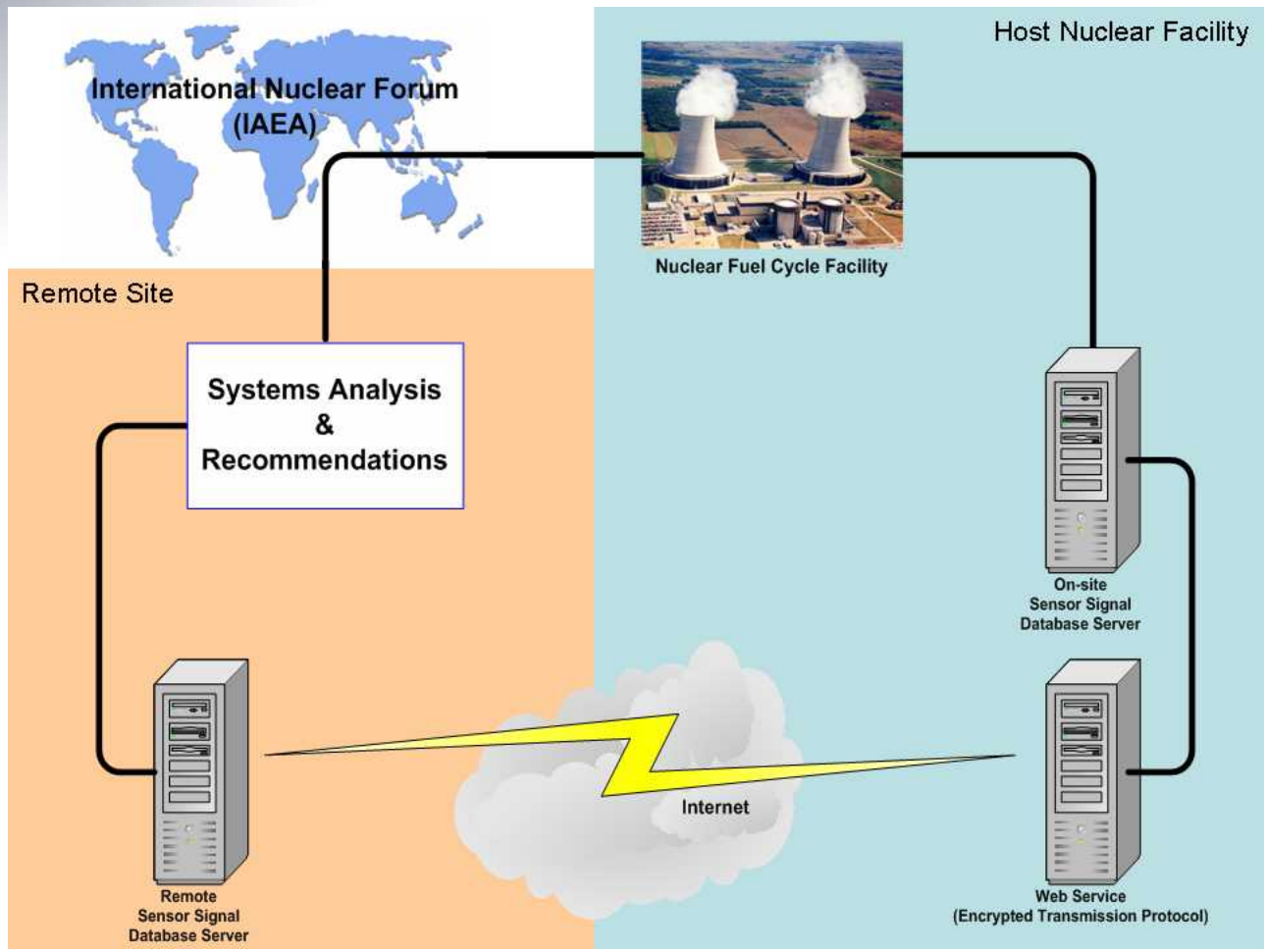
Conceptual Framework for Advanced Transparency



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Advanced Transparency for Global Deployment

- Nuclear facilities are becoming increasingly automated and will require minimum manual intervention
- We propose that automation provides a unique opportunity to utilize the abundance of process information in support of nonproliferation efforts
- When system data generated by an automated facility can be effectively secured, transmitted and analyzed, it supports plant transparency by allowing analysts to calculate diversion risk in real time

Designing Advanced Transparency Facilities

- Current technology readiness allows:
  - A very high degree of functional information on a data bus that can be authenticated, tamper-indicating, and encrypted
  - Real-time access to information as it is being generated
  - A system of necessarily required highly reliable components for effective and efficient automation

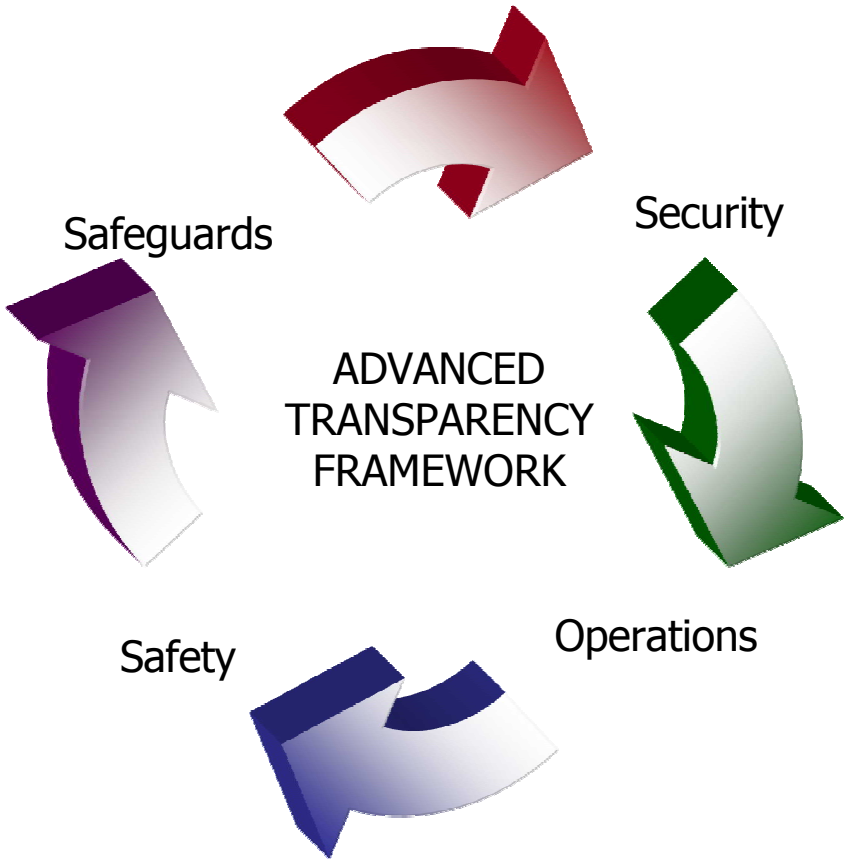
Technology Advancements
- **Automation**
- **Digital Electronics**
- **Encryption**

Design Principles

- Fully automated system, minimum manual operation
- All signals should pass through a single central processing unit for all plant operations
- System components and sensors should be highly reliable, fail-safe, and tamper resistant
- Secure information systems to distribute data without providing data to potential adversaries
- Analysis tools to digest the data provided into a uniform standard

Integration of Safeguards, Security, Operations, & Safety

- We believe that our framework can be expanded to include Security, Operations, and Safety.
- Thus, providing a means of complete TRANSPARENCY at a nuclear fuel cycle facility.



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Conclusion

- Transparency requires complete sharing of information in a particular issue, no negotiations.
- Advanced transparency provides a means to increase trust among nation-states and international parties.
- Built-in advanced transparency can minimize the risk of host diversion and theft, increase safety and reliability of operations, and provide secure data for IAEA independent verification.
- Built-in advanced transparency will allow nuclear suppliers a means of designing systems that are demonstrably safe and proliferation resistant