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Transparency Versus Remote Monitoring*

Virginia D. Cleary, Gary E. Rochau, and David L. York
Sandia National Laboratories
P.O. Box 5800, MS-0748,
Albuquerque, NM 87109-0748, USA 505/284-8902

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Transparency

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

Remote Monitoring

is the ability of the International Atomic Energy Agency (IAEA) to remotely obtain data from the verification systems installed by the IAEA for safeguards purposes

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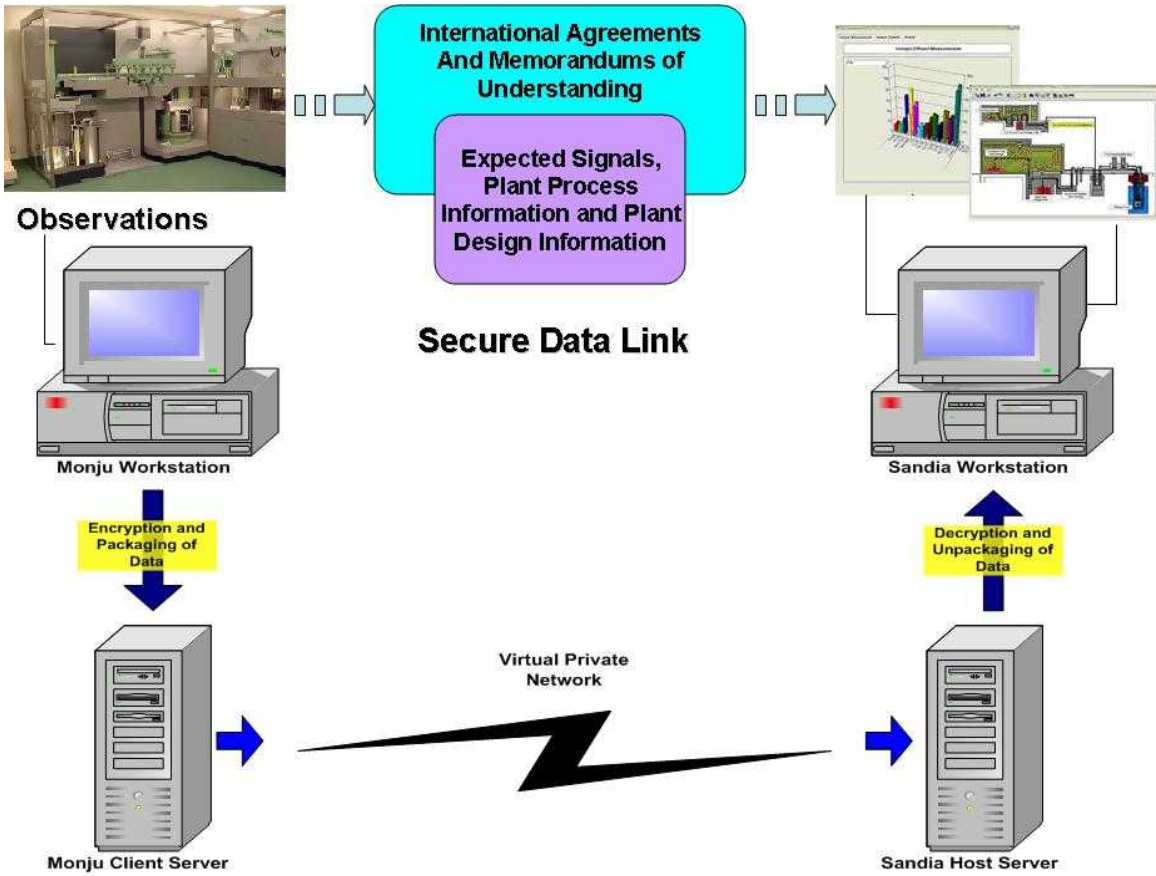
The Transparency Framework

- Plant process is automated
- Plant process data is immediately available for analysis
- Measures diversion risk
- Secure communication protocol between remote locations
- Secondary verification of operations



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Advanced Transparency Framework Development

- Utilizing the framework developed by Sandia National Laboratories & Japan Atomic Energy Agency (JAEA)
  - Demonstrate advanced transparency at the Monju Nuclear Fuel Cycle Model at the International Nuclear Information Training Center/JAEA
  - Implement advanced technology at the Monju Fast Reactor
- New innovations:
  - Continuous, real-time monitoring of process and signal data internal to nuclear fuel cycle facilities to ensure safe and secure operations
  - Generation of an international *remote monitoring test bed* in support of an advanced transparency concept

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Objectives

Transparency

- The objective is verification of declared operations and to access changes in terms of diversion risk
- Capable of detecting host diversion, theft, and safety issues

Remote Monitoring

- The objective is to verify operations and to make safeguard conclusions
- Primary purpose is to detect host/state diversion

Data Analysis

Transparency

- Data used is inherent to plant operations
- Data is collected and evaluated in real time
- Operations are declared prior to operating the plant
- Deviations are quantified in terms of diversion risk
- Instant assessment of plant status

Remote Monitoring

- Data used is obtained via extrinsic sensors and monitors
- Data is collected in a scheduled time frame
- Operations are declared afterwards
- Analysis is conducted subsequent to operations

BENEFIT: Transparency provides immediate detection of an increase in the risk of diversion as a result of deviations in plant operations from declared activities.

Focus of Monitoring

Transparency

- Safeguarding of nuclear materials
- Safety
- Operations

Remote Monitoring

- Safeguarding of nuclear materials

BENEFIT: The Transparency framework can be modified to provide a single system that can successfully ensure safe and secure operations of nuclear facilities.

Data Collection

Transparency

- Data is inherent to the plant
- No additional sensors or monitors are needed – except to provide another source of verification
- Data used is known by the operators

Remote Monitoring

- Relies solely on extrinsic monitors and sensors
- Data used is unknown to operators
- Cost of retrofitting the facility is high

BENEFIT: Transparency can be designed in; thus, eliminating the need and cost for retrofitting the facility.

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Measurement

Transparency

- Measures deviations from declared operations as change in diversion risk
- No data interpretation is necessary since the inherent sensors provide signals of binary nature
  - i.e. either “on” or “off”

Remote Monitoring

- Declared operations are verified, no quantitative measurement is reported
- Conclusions are drawn from extrinsic monitors and sensors
  - i.e. video camera

BENEFIT: Transparency relies primarily on objective data.

Agreements

Transparency

- Is a bilateral agreement between two (or more) parties)
- All data available is shared
- All results of data analysis are shared

Remote Monitoring

- International requirement with regards to the NPT
- All data collected is negotiated
- Only final conclusions are shared with the applicable parties

BENEFIT: Transparency is an agreement where sharing of all data and analysis occurs.

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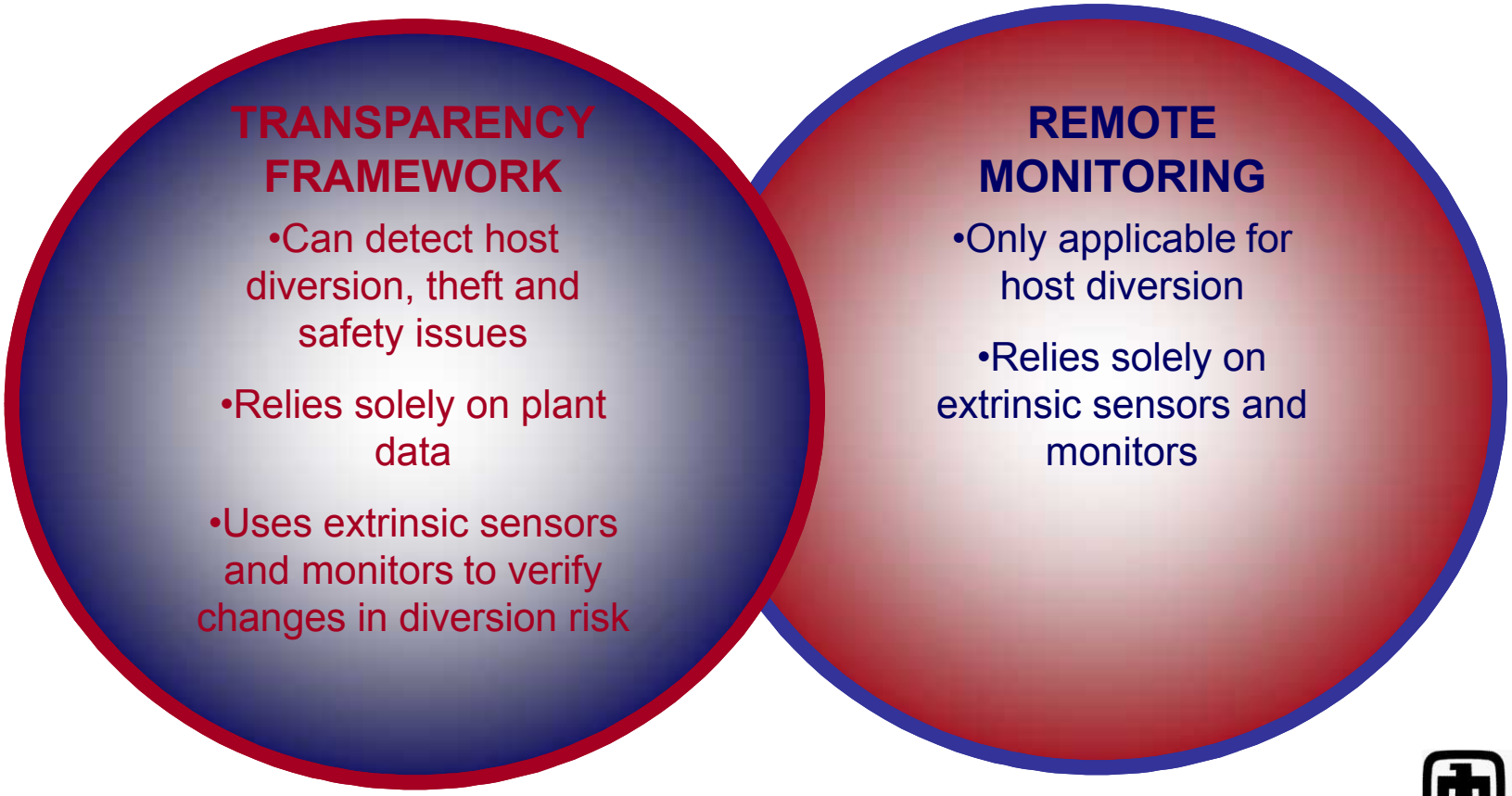
Conclusion

- SNL and JAEA are cooperating to develop an advanced transparency framework capable of assessing diversion risk in support of overall plant transparency.



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