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The Nuclear Materials Management Safeguards System

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2016

Annual Users Training Meeting

May 9-12, 2016 | New Orleans, LA

Update on the Efforts of Industry Working Group on the Global Cylinder Identification and Monitoring System (GCIMS)

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- The Evolution of the Global ID Standard
 - Industry-led initiative with DOE/NNSA team ensuring full utilization by the IAEA
- WNTI Working Group
 - Guidelines document
- IAEA Table Top Exercises, April 2016



- 2009: The Global ID project began as an NNSA initiative first mentioned at the ESARDA meeting
- 2011: DOE/NNSA began a formal UF₆ cylinder identification project with a 5-year program, culminating in a proof-of-concept design
- 2014: The WNTI working group was formed following a DOE/NNSA-sponsored workshop in Washington, D.C.
- 2016: The DOE/NNSA team conducted a table-top exercise with the IAEA of the global ID prototype in April
- 2016: The WNTI working group is currently working on a guidelines document for UF₆ cylinder identification and will meet again in December

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Global ID Overview

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NNSA



- Build on industry momentum to move toward a globally standardized, machine-readable identifier for UF₆ cylinders
 - World Nuclear Transport Institute (WNTI) working group
- Work with IAEA on opportunities to benefit from a globally standardized, machine-readable identifier
 - Authentication technologies
- Plan for a proof-of-concept demonstration of a standardized, machine-readable identifier with authentication



WNTI Progress Since 2014

- The WNTI working group last met in December of 2015 in London
- Adopted WG Objectives
 - Establish a *standard format* for the identification number marked on the nameplates or a supplementary plate affixed to model 30B and 48Y cylinder
 - Develop a *Requirements Document* for a global ID*
 - Investigate *methods for attaching* the global ID number onto the cylinders
 - Work with IAEA on an *application method* that may also satisfy IAEA requirements

*Eventually, the global ID would be machine-readable, using a handheld device



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WNTI Working Group Members

- Areva-NC
- Areva-TN
- Cameco
- Columbiana High Tech
- Daher-NCS
- Electricite de France (EdF)
- Global Nuclear Fuels (GNF)
- Honeywell
- Japan Nuclear Fuels Limited (JNFL)
- Nantong CIMC Tank Equipment Co
- Nuclear Fuel Transport Co
- ORNL
- TAM International
- Tenex
- Urenco
- Westinghouse
- Worthington



WNTI “Guideline for UF₆ Cylinder Identification”

■ Guidelines Document

- Initial draft: February 2016

- Ongoing discussions

- » Identifier size

- » ID management

- » Attachment locations

- Complete draft of Guidelines to WG: Sept - Oct

- Final group review meeting: December 2016 (London)

- Publish Guidelines 2017

■ Industry implementation – TBD



- Early in 2016, the working group began discussing the physical design of the proposed global ID for inclusion in the WNTI guidelines:
 - Is 10-digit format (4 letters + 6 numbers) acceptable?
 - Is a two-dimension (2D) barcode acceptable?
 - Is marking IDs on a metal plate acceptable?
 - Is attaching the identifier to the skirt acceptable?
 - Is attaching the identifier on the outside of the skirt acceptable?





- Initial responses to the questions:

Company	10-digit ID	2D barcode	Metal plate	Attach to skirt
Areva	Agree	Agree	Agree	Agree
Cameco	Agree	Agree	Agree	Agree
EdF	Agree	Agree	Agree	Agree
GNF	Agree	Agree	Agree	Agree
Honeywell	Agree	Agree	Agree	Prefer other
JNFL				
Tenex	Agree	Agree	Agree	Prefer other
Urenco	Agree	Agree	Agree	Checking
Westinghouse	Agree	Agree	Agree	Prefer other



Global ID – IAEA Interest

- Since project inception, the DOE/NNSA team has maintained contact with the Department of Safeguards in an effort to understand how the global ID is beneficial for inspection activities.
- The global ID would benefit the IAEA in several ways:
 - Tag Checking during the PIV would be faster, allowing inspectors additional time to spend in other areas (e.g., design information) and reduce their overall dose
 - Fewer transcription errors (when using hand-held reader)
 - Quicker resolution of discrepancies



Global ID – IAEA Table-top Exercises

■ Objectives

- Evaluate impact to IAEA inspection effort associated with implementation of the cylinder global identifier being proposed by WNTI
- Assess the safeguards use cases associated with tag-checking identified in the support program task



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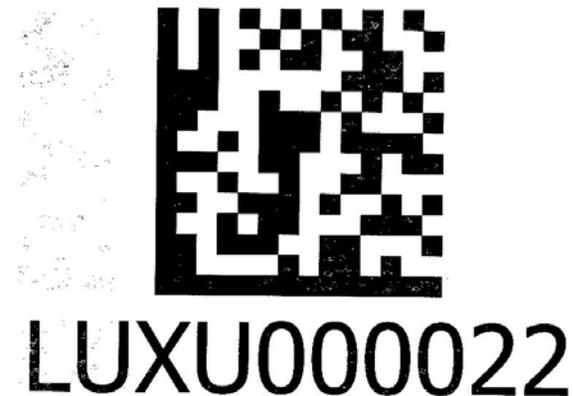
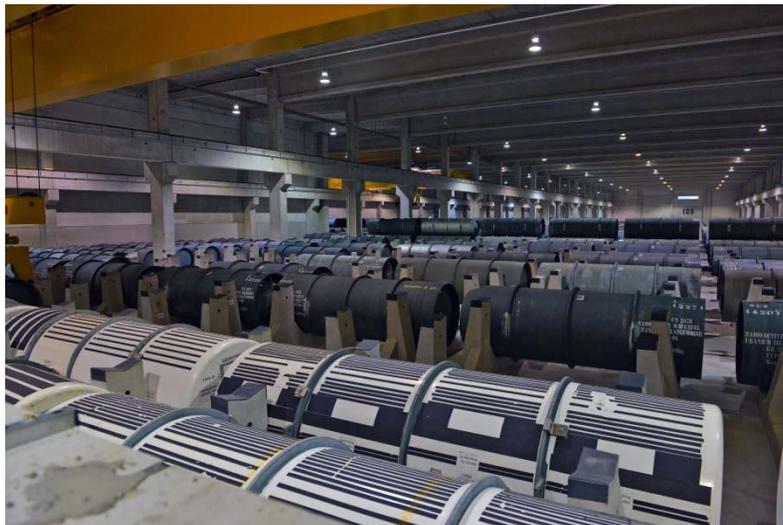
Global ID – IAEA Table-top Exercises - Continued

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- A UF₆ cylinder storage area at a fuel fabrication plant was simulated
 - Contained real-size photographs of model 30B cylinders
- 3 separate teams (with 3 inspectors) each performed a tag check:
 - Team 1: tag check using the current pen and paper approach
 - Team 2: tag check using global identifier (manual read)
 - Team 3: tag check using global identifier (using 2D barcode)



- Discrepancies between cylinder list and simulated storage raft included:
 - Cylinders were moved to different locations in the raft
 - Cylinders were moved out of the raft
 - Characters in the cylinder listing were transposed compared to the actual cylinder ID
 - An unlisted cylinder was found (cylinder moved into the raft)
 - One cylinder was duplicated and shown in two locations

- Feedback from IAEA inspectors:
 - The exercise was very representative
 - Sometimes real rafts have cylinders stacked 3 high
 - Cylinder photos were reasonably as easy to read as real cylinder nameplates
 - Real facilities can have a similar assortment of cylinder nameplates



- Inspectors were thorough in looking for cylinder IDs on the list
- Global identifier allowed the inspectors to perform the exercise quicker and easier
- Software will allow the inspectors to more quickly move to discrepancy resolution
 - For instance, recognizing that two cylinders in a long listing had duplicated nameplates was difficult
 - Software requirements and design should be inspector driven
- Training
 - Inspectors expressed desire to become more familiar with the global identifier and its attributes prior to implementation



- WNTI plans to publish its Guidelines Document in 2017
- Preliminary discussions have begun regarding future implementation once consensus is reached on the design
- The global identifier will benefit industry
 - During onsite PITs
 - By eliminating reading and transcription errors
 - Improving efficiency of IAEA inspections
- The IAEA can also benefit from the global identifier effort
- The global identifier will likely reduce time required to perform item counting and tag checking
- Software that makes use of the cylinder identifier would facilitate data fusion

