



Wholly-owned subsidiary of
Hitachi Zosen USA since 2013



50 Years in the Nuclear Industry -
Fuel Cycle Consulting and Used
Fuel Packaging and Transport



Eleven (11) Nuclear
Fuel Cask Systems Licensed in
the U.S.

U.S. Leader in Used Fuel
Transportation –
NAC-LWT Fleet

More than 500 Storage
and Transport
Systems Delivered

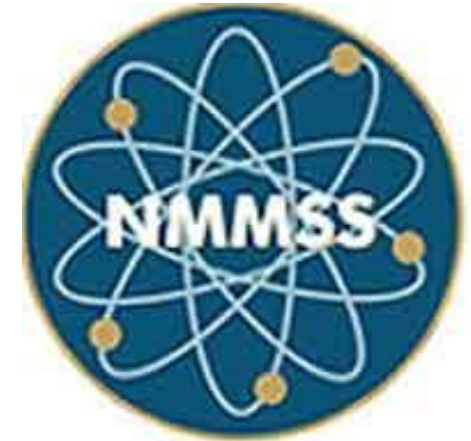
Pioneers in Dry Storage
Ultra-High Capacity Systems
HLW Dry Storage

Teamed with WCS and Orano to license the first Consolidated Interim Storage Facility

Delivered More than 65% of Dry Storage Casks Deployed at Decommissioned Locations

NAC's MC&A Experience

- Redesigned and rebuilt the U.S. State System of Accounting for and Control of Nuclear Material (SSAC)
 - Nuclear Materials Management and Safeguards System (NMMSS)
- Managed, operated, and maintained NMMSS for 15 years:
 - Prepared country obligation reports and participated in reconciliations
 - Prepared IAEA reports for the US selected facilities and performed transit matching (international reconciliation)
 - Reconciled facility book balances against reported inventories for each material type and obligation (over 700 facilities)
 - Produced ~2,000 reports each month



Obligation Requirements

- Major supplier countries require their nuclear materials to be separately:
 - Tracked
 - Reported (Country, Facility Type and Facility Level)
 - Reconciled
- Requirements differ and can be complicated
 - Not all uranium from a source may be obligated
 - Layered obligations can create unique problems (e.g., Canadian uranium enriched in the EU for fuel manufactured in the U.S., and shipped to a reactor in Japan)
- Likely to be additional countries requiring obligations in future

NAC Reporter Key Features

- Fully compliant with latest **IAEA** and **obligation** reporting requirements and ready to install
- Highly adaptable and customizable to meet any unique national requirements
 - Includes customizable language capability (English, Russian, and Kazakh language capability exists; Arabic is being added)
- Straight forward/intuitive data input and validation
 - Minimizes manual input
 - Screen forms match paper forms
 - Dropdown lists of available options
- Automates functions based on NAC operational experience
 - Data error identification & resolution
 - Reconciliation
 - Reporting
- Hardened system that has passed rigorous cyber security penetration testing
- Available both as a State Level system *and* a Facility Accounting system

Robust (and Growing) International Customer Base

- NAC has won 5 of the last 5 MC&A system bids:



- UAE Facility Level System for ENEC
 - *System delivered; active maintenance contract*



- Kazakhstan State Level System
 - *System delivered*

- Kazakhstan Facility Level System
 - *Development in progress; to be delivered in 2019*



- UK State Level System (to support Brexit)
 - *System delivered in six months; on-going support contract*



- Saudi Arabia State Level System
 - *Kick-off meeting scheduled in June 2019*



- In discussions with IAEA to support deployment to member countries

State/Facility System

- Can be deployed to a web server, laptop or desktop
- Due to the sensitivity of the data, most elect to deploy to a standalone web server
- With sufficient protections in place, it can be deployed to a web server with an internet connection

Security Settings and Testing

- Penetration (PEN) Testing/Cyber Attack Testing
 - NAC Reporter has successfully completed 10+ PEN test by 6 organizations and cyber attack testing
 - Level of testing depends on Network setup and classification of data
- Open Web Application Security Project (OWASP) great source for Cyber Security protection

Security Settings

- Two Factor Authentication
 - NAC Reporter uses a combination of Windows login, Token Numbers or internal accounts
- Password complexity is control by the Application System Administrator
- Available menu options are based on assigned user functions

Security Settings

- Encryption of communication using SSL/database encryption
- Application Logs
 - User activities

Data Validation

- Validation checks are rules and regulations for reporting of nuclear material
- Reporter has two types of validation processes encompassing around 200 checks
 - Basic Field Checks
 - *Required fields*
 - *Valid values*
 - Field Cross-Checks – the value in a field determines valid values for other fields
- Reporter will flag the problem data, identify what is wrong and suggest corrections

Software Platforms/Requirements

- Reporter has been developed using widely available, fully supported and familiar software tools
 - Microsoft Visual Studios 2013 (Visual Basic), will be updated to 2017 version late this year
 - Microsoft SQL Server 2016
 - DevExpress Dxperience 17.6
- Can be installed on a laptop, desktop or server
 - Windows Server 2012 R2 (or newer version)
 - Windows 10
 - Internet Information Services (IIS) 7.5 (or newer version)

Summary & Conclusions

- Modern, efficient, flexible, secure, easy-to-use and inexpensive SSAC with ability to be deployed in multiple languages
- Meets all IAEA requirements & tracks obligations
- Can be readily customized to meet customer specific needs
- On-going support by expert nuclear material accounting and programming staff

**Powerful, low-risk solution for effective & efficient
nuclear material tracking**