

# ***National Model Codes and Standards – Supporting Deployment of Safe Energy Storage Systems***

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OE Energy Storage Systems Program Review

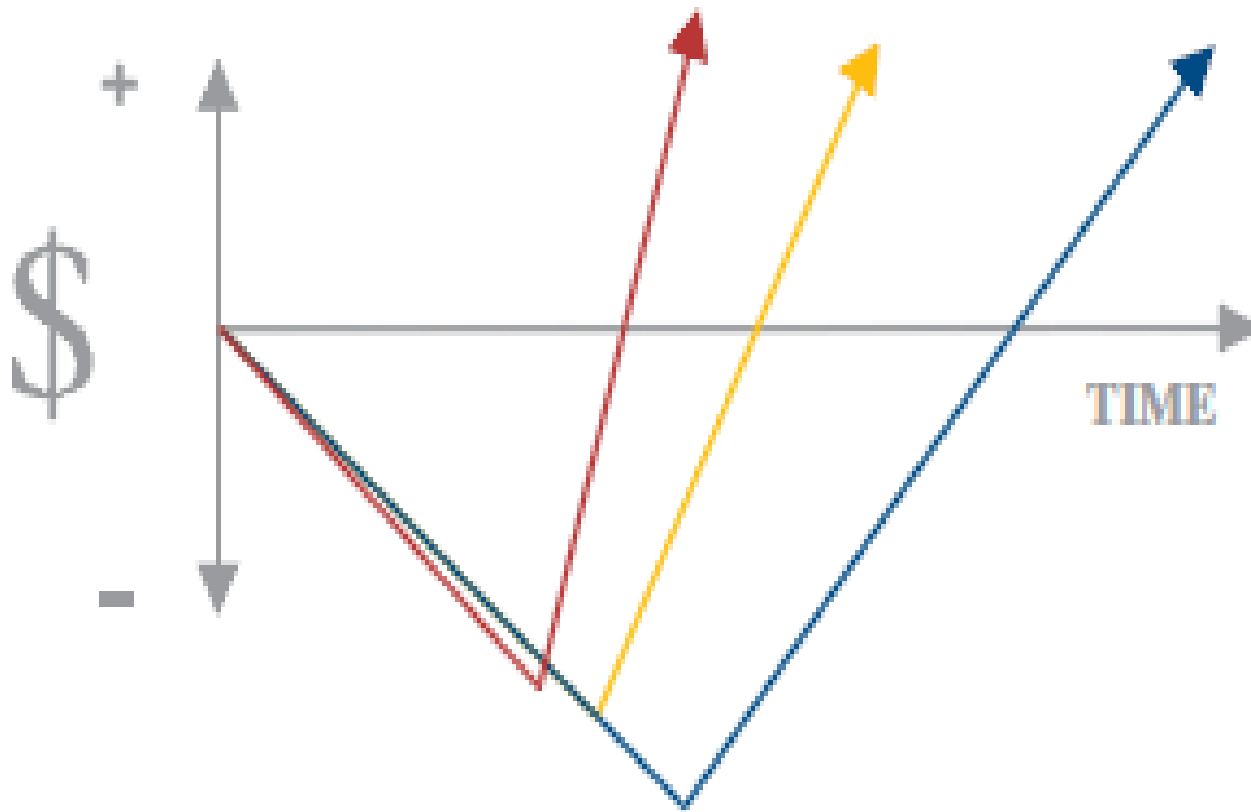
September 19, 2014

# Purpose and Expected Outcome

- Highlight recent safety-related activities fostered by the DOE OE ESS program focused on national model codes and standards
  - Initiated in response to the February 2014 DOE OE ESS safety workshop
  - **Basic information on model codes and standards development and deployment (Codes 101)**
  - **Inventory of model codes and standards related to ESS**
  - ID of and work on standards revisions with short term deadlines
- A better understanding of codes, standards and regulations (CSR), how they impact ESS and increased collaboration by stakeholders in addressing ESS safety through CSR

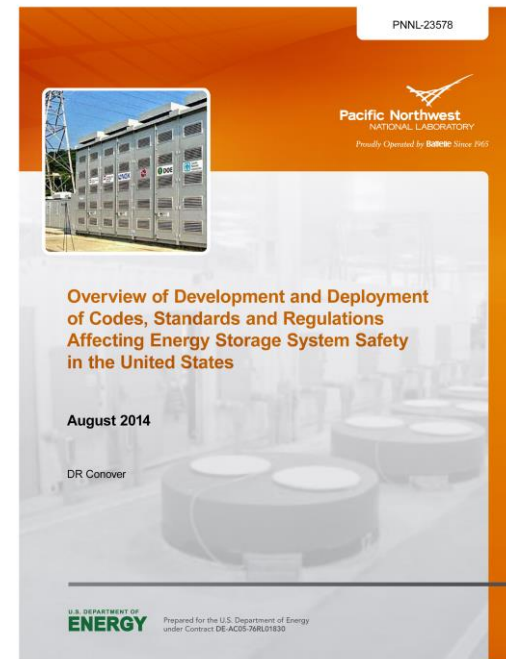
# Relevance

Codes, standards and regulations can impact ESS development and deployment costs and timeframes



# Basic Information – Codes 101

- Acquaint stakeholders with all aspects of the model codes, standards and regulations (CSR) framework
- Foster a more in depth and uniform understanding of safety-related CSR development, deployment and compliance
- Enhance communications and spur the collaboration needed to revise existing or develop new CSR
- Updated CSR can support more timely acceptance and approval of safe ESS

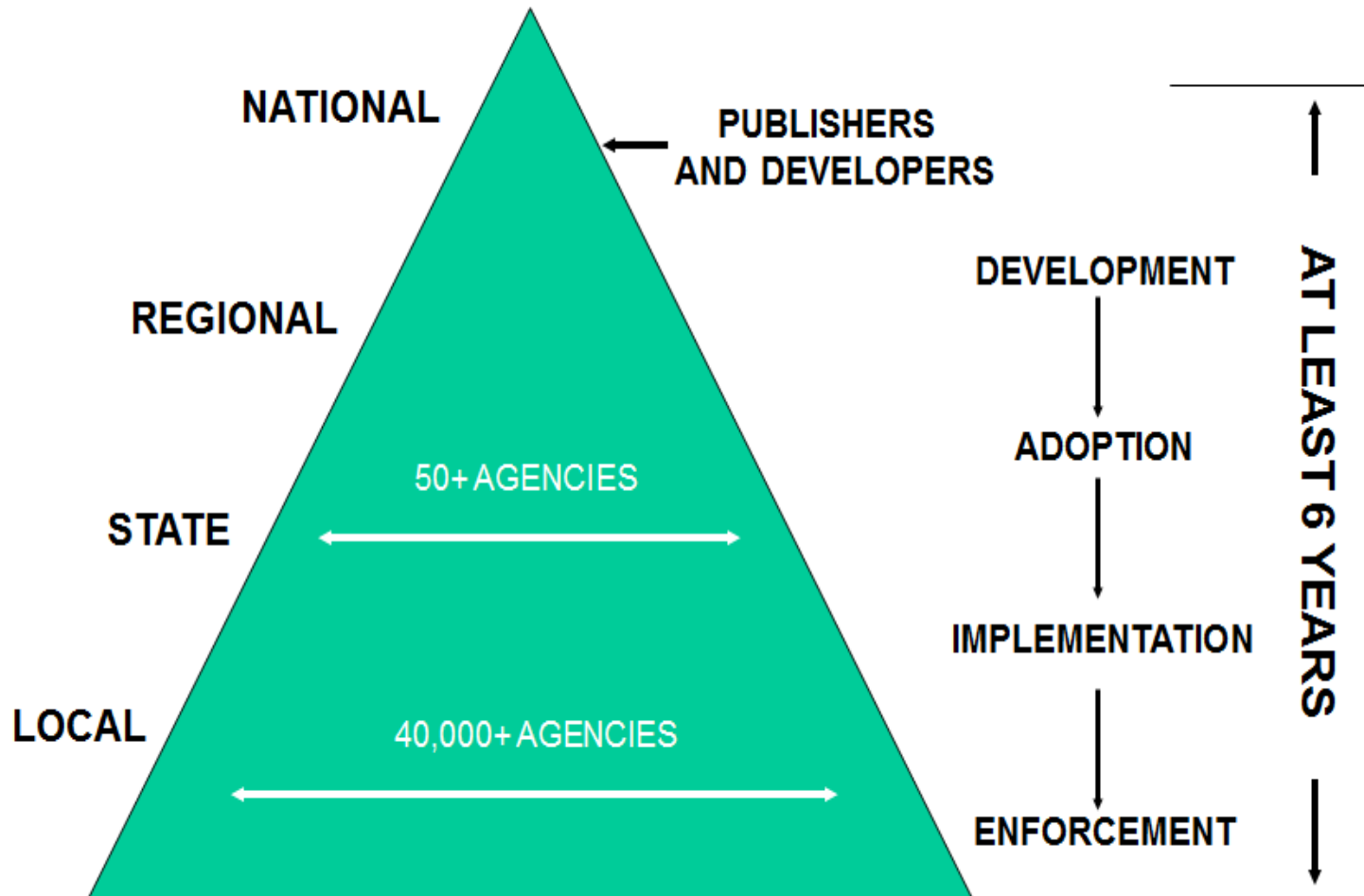


# Key Terms

- Adoption
- Code
- Conformity Assessment
- Deployment
- Development
- Model Code
- Regulation
- Standard
- Voluntary Sector

# CSR – High Level Overview

## Development to Compliance



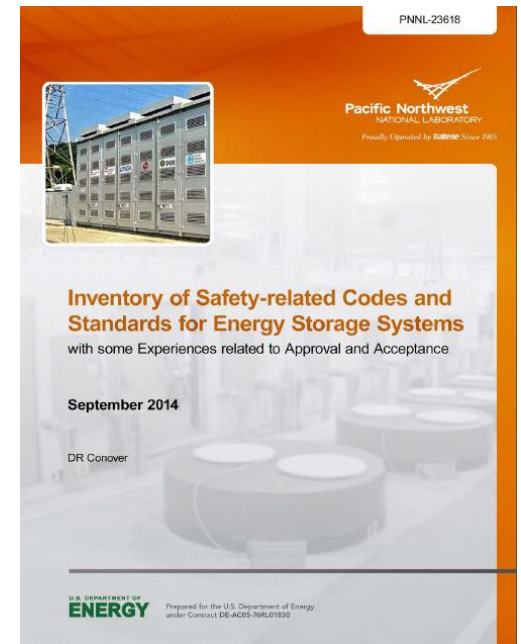
# Recommendations

- Achieve a common understanding of CSR by all ESS stakeholders
- Know the benefits of action, consequences of inaction and value of collaboration
- ID needs and gaps based on ESS technology and current CSR
- Identify and conduct needed research and analysis to address needs and gaps
- Apply outcomes to foster CSR revisions and more timely and streamlined ESS deployment
- Serve as a basis for collaboration
- Track success and circle back as ESS evolves and CSR need additional revision

**CSR Inventory**

# Inventory of Safety-Related CSR for ESS

- ID current CSR related to safety that could apply to ESS
- Gather and report experiences to date with securing approval of ESS in relation to CSR
- Provide information needed to secure ESS approval where current CSR may not specifically apply to what is proposed





# Why?

- You need to know where you are and where you want to go to ID gaps
- Gaps help ID needs that may can be addressed by research, analysis, modeling and education
- Filled needs facilitate successful revision to or development of new CSR
- CSR deployment requires education, training, documentation and technical support
- ESS development and experiences with ESS installations are dynamic as are CSR

# Inventory

Standard designation, title, scope summary and comments intended to focus further assessment of the standard and possible use or revision

- Components
- Complete systems/packages
- Installation
- Commissioning and O&M
- Incident response
- Transport

# Reported Experiences

- ESS systems and components of systems tested and listed
- ESS installation per the NEC and IBC
- Basis for approval of an ESS assembled from different components is based on an engineering analysis of those components
- Regulators generally accept an ESS that is tested and listed but additional discussion with them may be needed
- Regulators will inspect the ESS installation in relation to applicable CSR
- In the absence of specific CSR others may be adapted and used as a basis for approval
- Where the utility is the approving authority the approval process can be less cumbersome if the utility has a singular department to address approvals
- CSR that were used (if any) as a basis for safety review and approval of ESS installations vary considerably
- There is a tendency to 'pass the buck' when it comes to documenting CSR compliance

# ESS Short Term Approval

- Components and systems not covered by existing standards will be challenged to be tested and listed but can be approved using NFPA 791 *Recommended Practice and Procedures for Unlabeled Electrical Equipment Evaluation*
- Performance equivalency provisions in CSR provide for approval on the basis that what is proposed is no more hazardous nor less safe than something else specifically provided for in CSR
- Approvals for unlabeled equipment or equivalent performance are generally done on an individual basis for each ESS installation as directed by the approving authority (utility, state or local agency, etc.)
- The involvement of accredited third-parties in conducting these evaluations can foster the acceptance of ESS because those evaluations can be used as a basis for approval by the approving authority
- Even if the ESS is specifically covered by CSR the availability of robust and uniform documentation and compliance verification guidance for use by approving authorities will foster deployment of safe ESS

# Next Steps

- Put the CSR inventory information into a web-based database that can be readily updated and serve as a focal point for safety-related CSR efforts
- ID gaps in CSR based on a comparison of the criteria in the CSR covered in the inventory and current and future ESS technology
- Collaborate to address known opportunities to close gaps
  - Development of proposed changes to NFPA 70 due November 7, 2014
  - Development of proposed changes to NFPA 790 and 791 due July 6, 2015
  - Development of proposed changes to the IBC, IEBC, IMC and IPC due January 12, 2015
  - Review proposed changes to IEEE C2 (NESC) published September 1, 2014 for review and comment
- Collaborate to address opportunities to address additional gaps that are identified pursuant to the DOE OE ESS Safety Strategy
- Identify opportunities to develop new CSR to address gaps or reduce the number of CSR by putting safety related criteria in one document

# Success

- ✓ All having any connection with ESS are on the same page regarding how to address safety
- ✓ Readily and uniformly secure approval for and acceptance of ESS under CSR
- ✓ Minimization of safety related incidents
- ✓ First responders can address an incident if it happens with no loss of life and minimal property damage

**Collaboration Amongst  
All Stakeholders**

# THANKS

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## *Acknowledgements*

- US DOE Office of Electricity – Dr. Imre Gyuk, Energy Storage Program Manager