# National Cybersecurity Center of Excellence

## Manufacturing Community of Interest Update

11/20/2018

NIST
National Institute of Standards and Technology
U.S. Department of Commerce

NCCoE
NATIONAL CYBERSECURITY CENTER OF EXCELLENCE

# Agenda

- **Welcome and Introductions**
- ***Securing Manufacturing Industrial Control Systems: Behavioral Anomaly Detection NIST-IR 8219*** **Update**
- **New Project: Protecting Information System Integrity in Manufacturing Environments Project Description**
- **Questions and Open Discussion**

# Manufacturing Behavioral Anomaly Detection Use Case

## NISTIR 8219: Securing Manufacturing Industrial Control Systems – Behavioral Anomaly Detection

- **Single capability scope in two manufacturing demo environments**
  - Collaborative robotics system
  - Simulated chemical process system
- **Security characteristics were mapped to the Cybersecurity Framework**

# Manufacturing Build Team

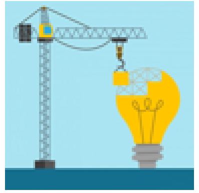
CyberX

OSIsoft®

SECURITY MATTERS

SECURENOK®

# Securing Manufacturing Industrial Control Systems: Behavioral Anomaly Detection - Project Execution Timeline

| DESCRIBE | FORM TEAM | DESIGN | BUILD PLAN | BUILD | DOCUMENT | OUTREACH |
|---|---|---|---|---|---|---|
| | | | |  | | |
| Publish the NCCoE building block description | Form the team and complete the FRN, LOI, and CRADA | Design and engineer the architecture and usage scenarios taking into consideration resources | Develop the execution plan for building the demonstration based on the design | Compose, build the demonstration, and perform security functional tests | Develop the NIST-IR for publish as a public draft and final document | Present at public events and interact with community of interest |
| Q3 FY 2017 | Q3 FY 2017 | Q4 FY 2017 | Q1 / Q2 FY 2018 | Q2 FY 2019 | Q1 FY 2019 | Q2 FY 2019 |

# Behavioral Anomalies

- **Abnormal equipment operations**
  - High trouble call frequency
- **Sensor disruptions**
  - Door sensor failure
- **Communication disruptions**
  - Robot coordination failure
- **Environmental changes**
  - High work cell temperature
- **Data corruption**
  - Invalid process variable values

# NISTIR 8219

## *Securing Manufacturing Industrial Control Systems: Behavioral Anomaly Detection*

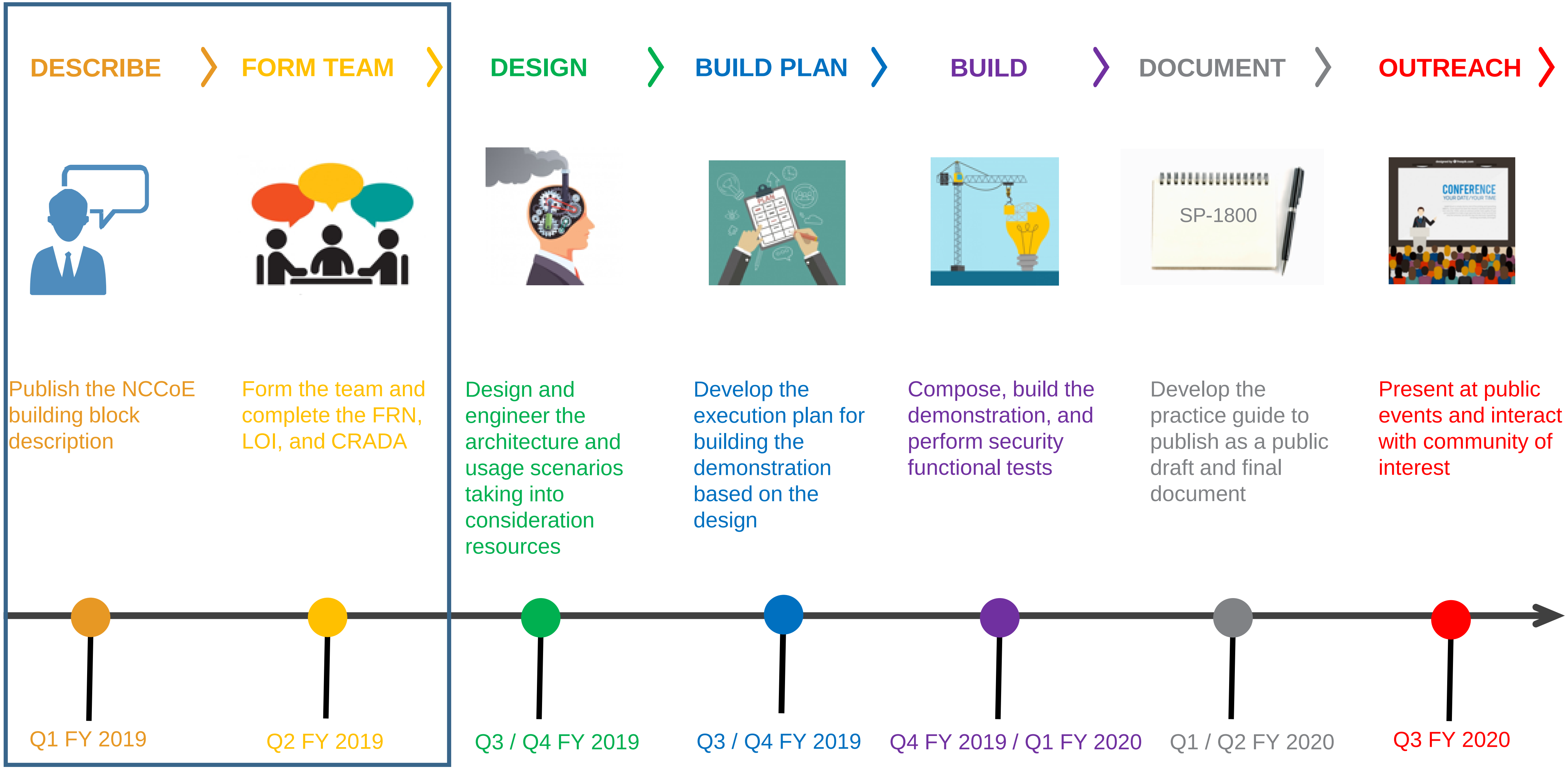
- **Project goal:**
  - demonstrate behavioral anomaly detection techniques that businesses can implement and use to strengthen the cybersecurity of their manufacturing processes.
- **Three detection methods:**
  - network-based
  - agent-based
  - operational historian/sensor-based

# *New Project:* Protecting Information System Integrity in Manufacturing Environments (name may change)

**This project will address the detection/prevention of:**

- unauthorized software installation
- unauthorized data modification/deletion
- unauthorized device configuration changes
- unauthorized access
- PLC program changes
- firmware changes
- data exfiltration
- malware

# Protecting Information System Integrity in Manufacturing Environments - Project Execution Timeline



DESCRIBE

Publish the NCCoE building block description

Q1 FY 2019

FORM TEAM

Form the team and complete the FRN, LOI, and CRADA

Q2 FY 2019

DESIGN

Design and engineer the architecture and usage scenarios taking into consideration resources

Q3 / Q4 FY 2019

BUILD PLAN

Develop the execution plan for building the demonstration based on the design

Q3 / Q4 FY 2019

BUILD

Compose, build the demonstration, and perform security functional tests

Q4 FY 2019 / Q1 FY 2020

DOCUMENT

Develop the practice guide to publish as a public draft and final document

Q1 / Q2 FY 2020

OUTREACH

Present at public events and interact with community of interest

Q3 FY 2020

# NCCoE ESAM Team: Contacts / Roles

| | | |
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