PANEL 2: STANDARDS, POLICY, AND GUIDANCE

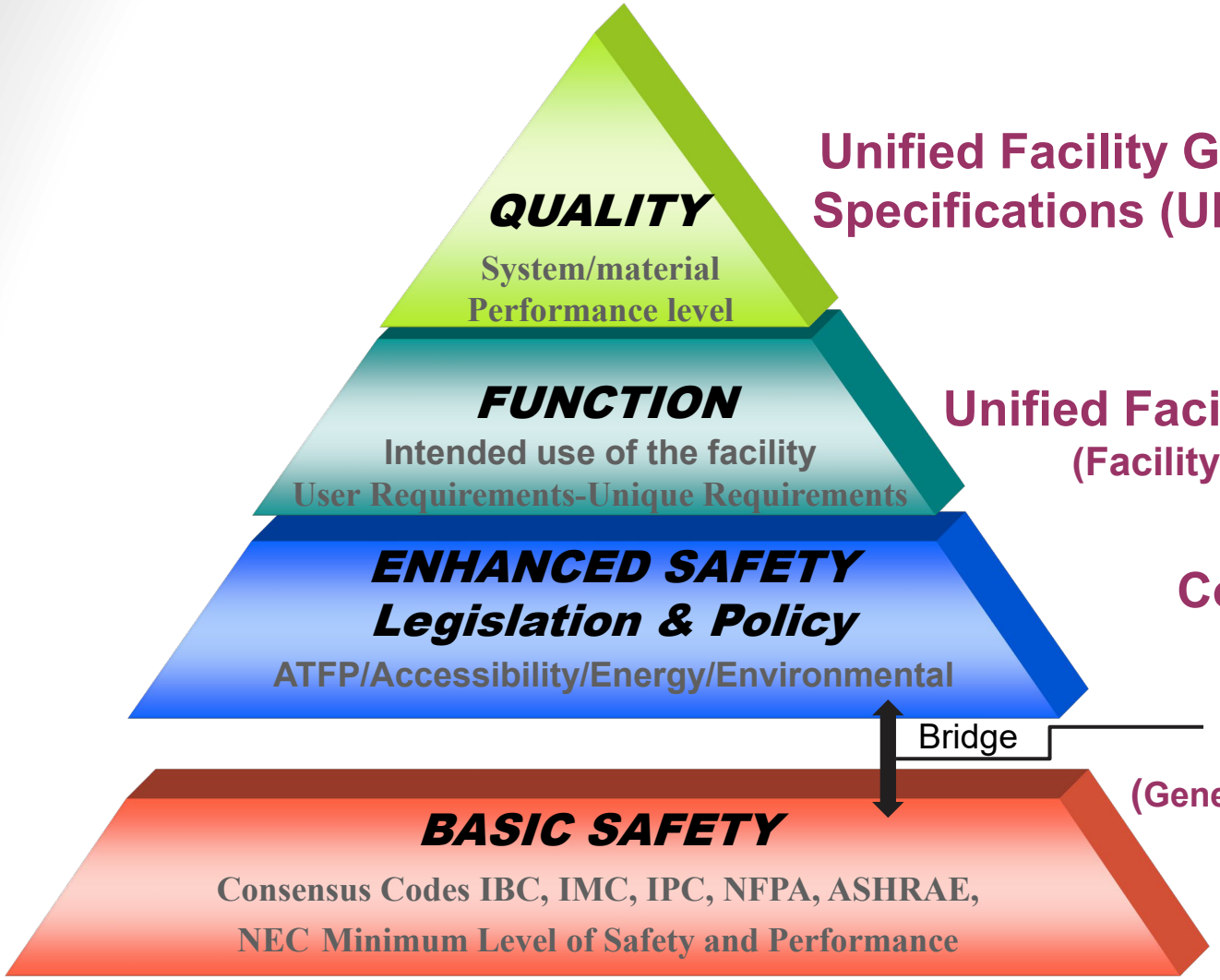
RMF in Control System Design-Construction

Joe Bush, PE
Mechanical Engineer
USACE-ERDC-CERL

9 July 2024

U.S. ARMY
US Army Corps of Engineers
ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

BACKGROUND – STANDARDS & CRITERIA



Unified Facility Guide Specifications (UFGS)

Guide specifications.
Example/template implementation of code
Almost always optional for designers
~800 UFGS

Unified Facility Criteria (UFC)
(Facility Type Specific)

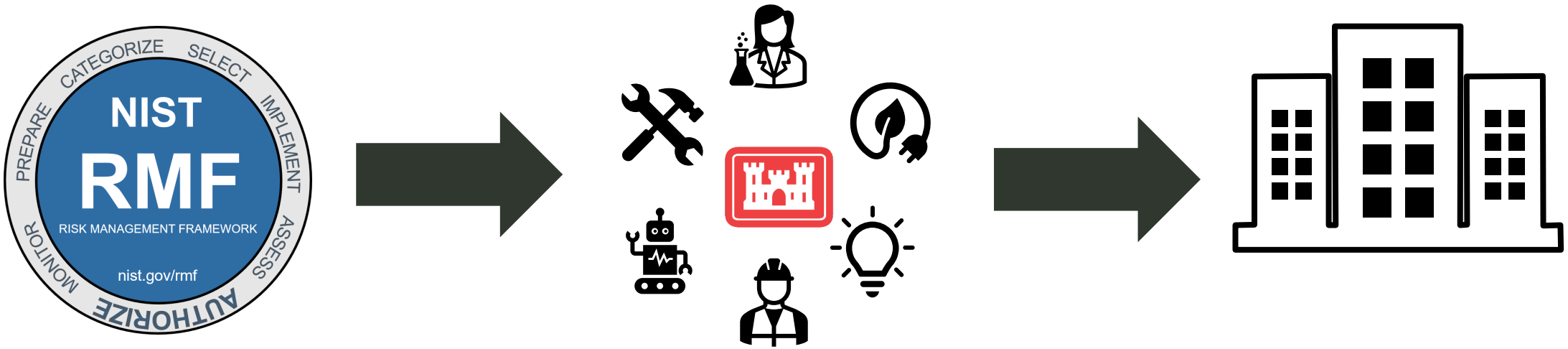
UFCs are building CODE.
Mandatory enforceable standards.
~160 UFCs

Core UFCs

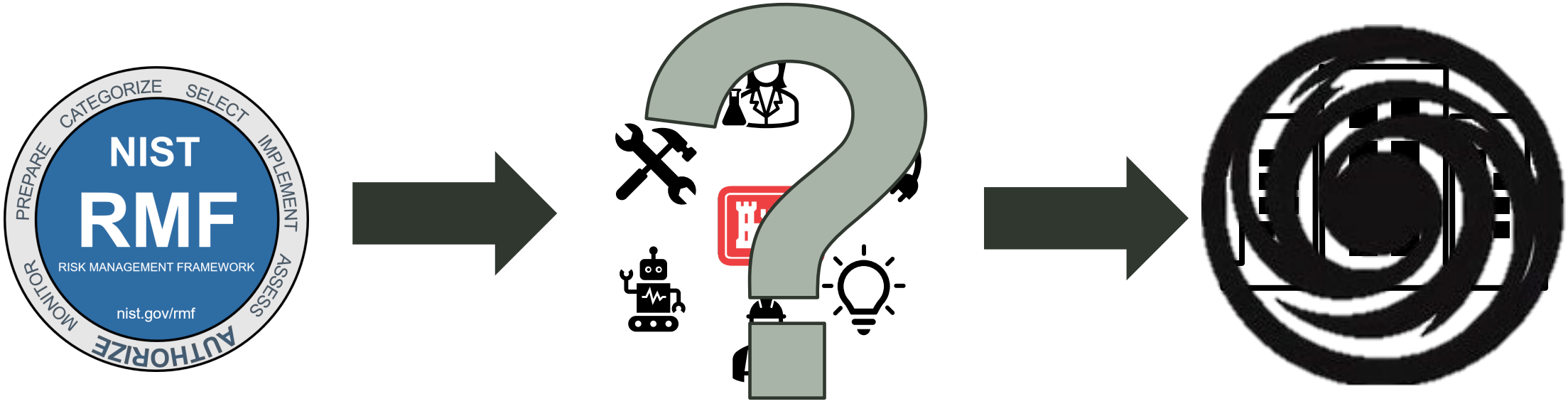
UFC 1-200-01
DoD Building Code
(General Building Requirements)

INDUSTRY STANDARDS

OK DESIGN/CONSTRUCTION , GO DO RMF!



OK DESIGN/CONSTRUCTION, GO DO RMF!



TWO MAIN ISSUES

RMF DESIGNED FOR COMPUTERS, NOT CONTROL SYSTEMS

Not everything can be done as written

Some things can't be done at all

Some need to be done differently

Interpretation/translation is needed

A LOT OF RMF/CYBERSECURITY IS ABOUT HOW THE SYSTEM IS USED

Building it is different than using it

But you have to build it to be used

There are so many requirements, which do we do when we build it, which are for the owner to handle?

TWO MAIN ISSUES

RMF DESIGNED FOR COMPUTERS, NOT

A LOT OF RMF IS ABOUT HOW THE

Not every

using it

Some

e used

Some

nts, which

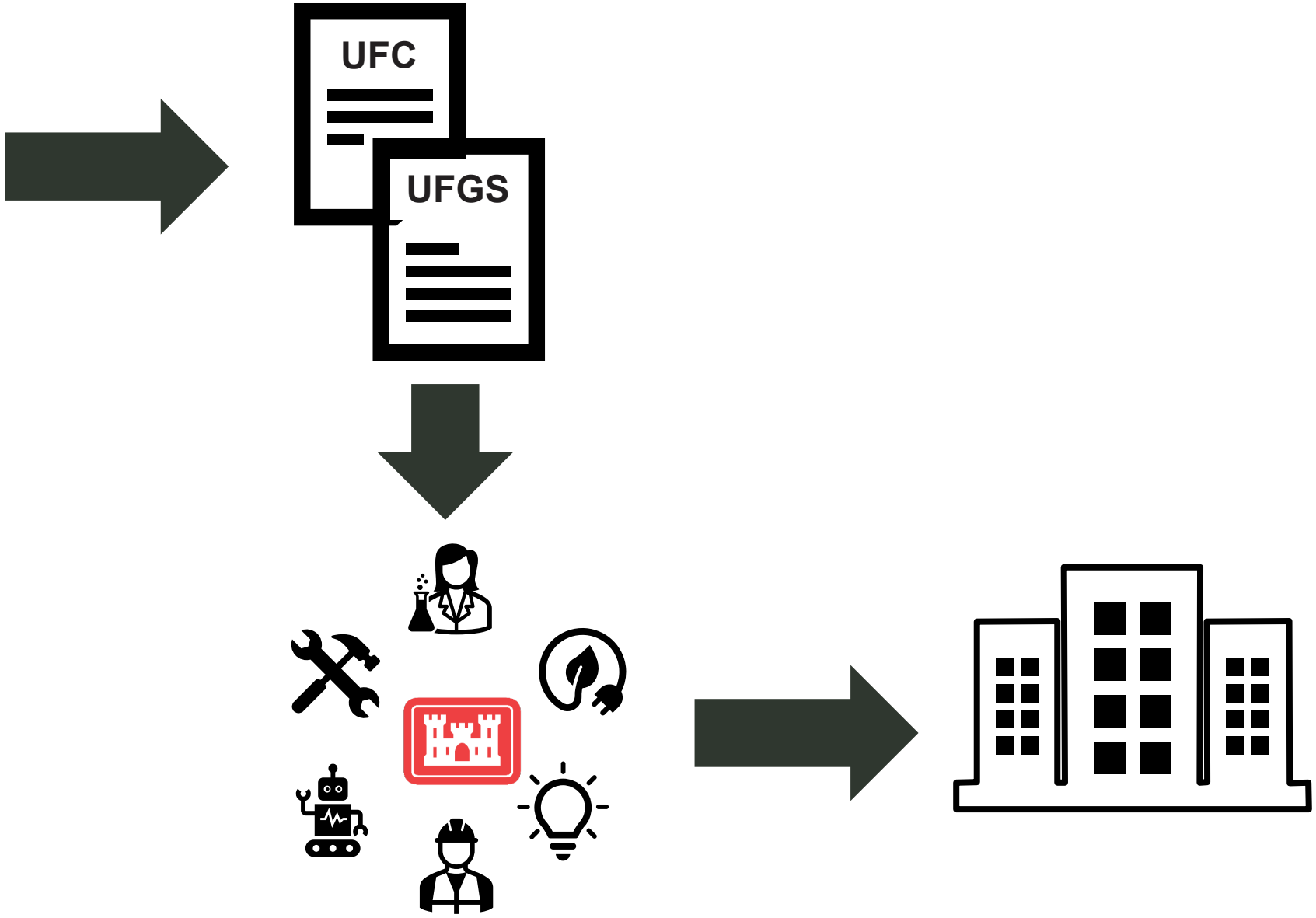
ch are for

Interpre

But ultimately, these are just design requirements and constraints.

Cybersecurity design isn't different than any other design - you identify the requirements and incorporate them.

PATH TO SOLUTION



UFC 4-010-06 CYBERSECURITY OF FACILITY-RELATED CONTROL SYSTEMS

Design requirements to incorporate cybersecurity into control system design.

1) Fundamental design requirements (kinda like “cyber informed engineering”)
   - Minimize Network Dependency
   - Reduce Extraneous Functionality
   - Design for Graceful Failure
   - No “IT” functions (VoIP, internet, etc.)
   - No Remote Access

2) Identify what else can be done in design and do it
   - What can be required of the system? Capabilities, initial configuration.
   - What has to be documented about the design/installation system?
   - What information about the system do others need?

UFGS 25 05 11 CYBERSECURITY FOR FACILITY-RELATED CONTROL SYSTEMS

Construction requirements to incorporate cybersecurity into control system

- Requirements/restrictions on device capabilities
  - “No wireless”
  - “6 character pin on a thermostat”

- Requirements for documentation/submittals
  - Inventory report
  - Communication Report

- Uses “Tailoring options” for mass tailoring by system type. Designer options for further customization.

CONCLUSION

By creating specific criteria and specifications for cybersecurity of control systems we make cybersecurity more like any other design problem.

- Identifying what security controls can be addressed bounds the problem and allows designers to focus on what they can control
- Providing template implementation requirements (UFGS) eases burden on the designer by further reducing the amount of “figuring it out”
- For a LOW Impact system, designer have to worry about approx. 150 things (CCIs) instead of 900+