



# Waste Treatment Plant Project



## 2016 Supply Chain Collaboration Event C&I Challenges

# Introduction

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## Starting Point

- This is intended to be a very collaborative session
- Bechtel and WTP cannot succeed if vendors do not succeed
- This dovetails with other sessions
  - Vendor Submittals
  - Electrical Challenges

## Opening Questions of/from Vendors

- Who is here?
- What do you supply?
- What experience do you have with commercial nuclear projects?
- What experience do you have with government (DOE) nuclear projects?
- What experience do you have with Bechtel?
- What experience do you have with the WTP project?
- What issues do you see in working with Bechtel National Incorporated on WTP?

# Presentation Summary

- Common Language
- Describe WTP C&I Procurement Process
- Common Struggles
  - ASME B31.3
  - Maintaining NEMA Ratings
  - Differences between Electrical and C&I Color Coding
  - Software
  - Vendor Submittals
  - Tagging/Labeling
- Questions?

# Common Language

- C&I vs I&C
- Q vs CM
- Safety vs Non-Safety
- Safety Significant vs Safety Class (SS vs SC)
- Packaged vs Discrete
- Equipment Qualification (EEQ and ESQ)
- Commercial Grade Dedication (CGD)
- Material Requisition (MR)
- Purchase Order (PO)

# WTP Procurement Process – From the Technical Perspective



## Material Requisition for Quote

- Scope
  - Line Items
- Technical Requirements
  - Datasheet
  - Specifications
    - General
    - Dedicated Equipment
  - Drawings
  - Technical Notes
  - Supplier Deviation Disposition Request (SDDR)
- Submittals
- Quality Verification Documents (QVD)
- Witness and Hold Points

# WTP Procurement Process – From the Technical Perspective



- Pre-Award Technical Evaluation
- Material Requisition for Purchase
- Post Award Technical Evaluation
- Submittals
  - Permission to Proceed
- Fabrication
  - Witness and Hold Points
- Shipment/QVD

# Common Struggles with both Discrete and Packaged Equipment – ASME B31.3 1996



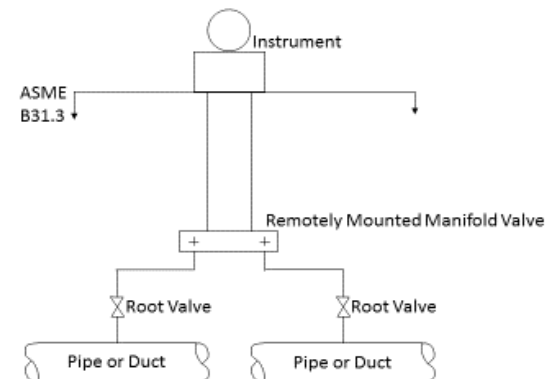
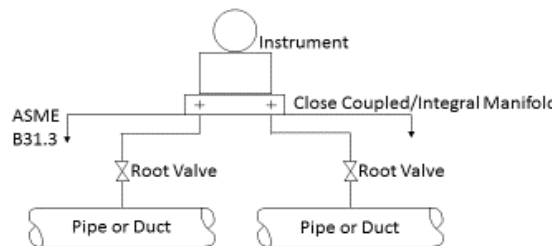
- ASME B31.3 is the Piping Standard for 99% of this project
- What are the alternatives for devices?
  - Unlisted Components
  - At times, Vendor Standards
- When does it apply?
  - When ASME B31.3 says it does
    - Per Section 322.3.1 – ASME B31.3 does not apply to instruments
    - Section 300.2 piping components “include...in-line portions of instruments...”

# Common Struggles with both Discrete and Packaged Equipment – ASME B31.3



## ■ Remote Mounted Instruments

- Example – Pressure Transmitter
- Not Subject to ASME B31.3
- Designed and manufactured to some standard – Maximum Allowable Working Pressure (MAWP)



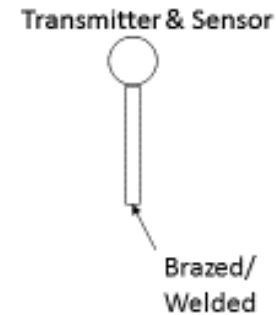
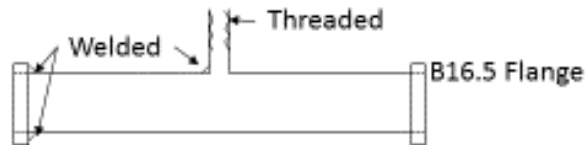


# Common Struggles with both Discrete and Packaged Equipment – ASME B31.3



## ■ Insertion Instruments

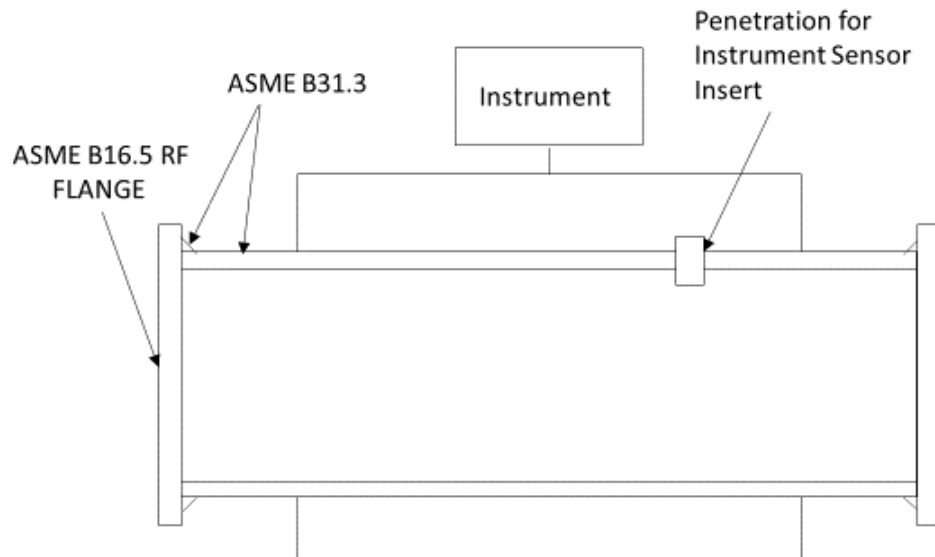
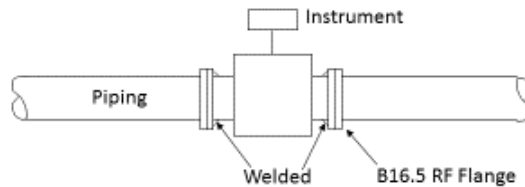
- Example – thermowells, thermal flowmeters, or pitot tubes
- Pipe vs the instrument



# Common Struggles with both Discrete and Packaged Equipment – ASME B31.3

## ■ In Line Instrument

- Instrument acts as the primary flow path
- Pipe equivalent is subject to ASME B31.3
- Inserted portions – vendor standards



# Maintaining NEMA Ratings

## ■ Common Ratings

### – Discrete and Packaged Components – NEMA 4X

#### ○ Type 4X

- Indoor and Outdoor
- Protects personnel
- Protects equipment
  - Windblown Dust
  - Water/Rain, sleet, snow, splashing water
  - Directed Water – hose

### – Discrete and Packaged Equipment – NEMA 12

#### ○ Type 12

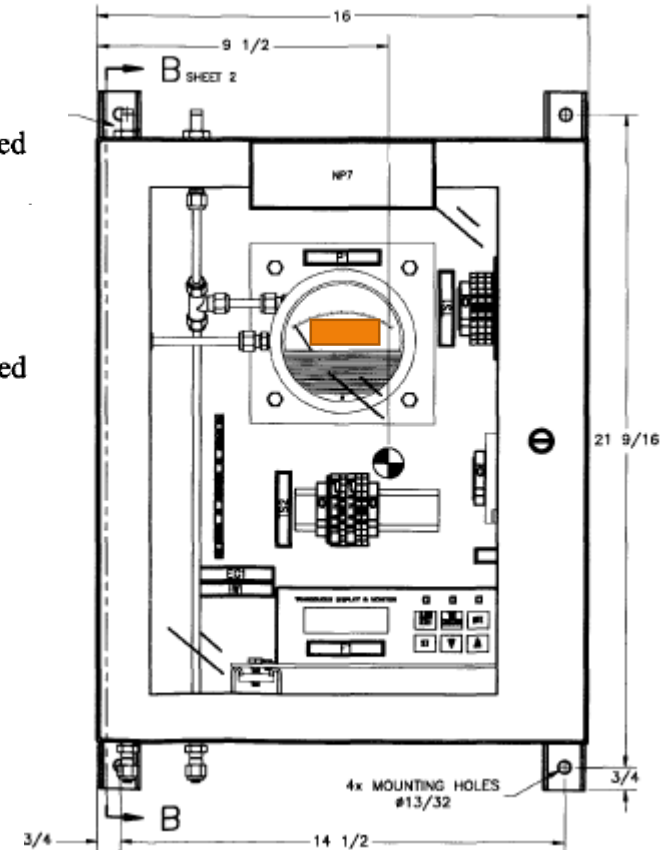
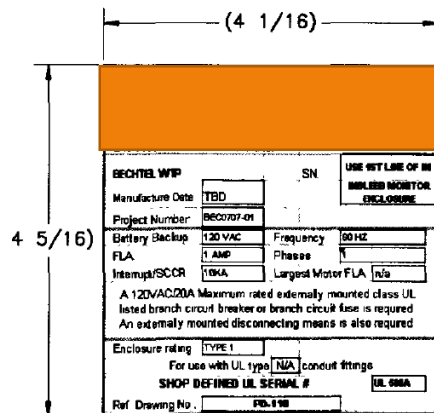
- Indoor use
- Protects personnel
- Protects equipment
  - Solid objects – dirt, dust, fibers
  - Some protection from water dripping and light splashing

# Maintaining NEMA Ratings

- Discrete and Packaged Equipment – NEMA 1
  - **Type 1**
    - Indoor Use
    - Protection of personnel
    - Some protection against solid foreign objects (falling dirt)

# NEMA Rating Error Example

- 3.1.3 Enclosures shall be provided as identified on the datasheet or Buyer provided drawings and shall comply with NEMA 250 and ICS 6. Additionally,
- 3.1.4 The NEMA rating on Enclosures and Rack junction boxes shall be maintained where cable and wire penetration is required.



REV	DESCRIPTION	DATE	BY
1	CSD20168WSS		
	ENCLOSURE 20x16x8 W/ WINDOW		HOFFMAN
	BACKPANEL ASSEMBLY		CONCEPT SYSTEMS INC

# Differences between Electrical and C&I Color Coding

- Control Panels/Annunciators/HMI Screens follow the color scheme found in 24590-WTP-3PS-JQ07-T0001 Engineering Specification for Instrumentation Packaged Equipment, Section 3.3.5
  - Green = Running, ON, Normal
  - Red = Stopped, OFF, Alarm
  - Yellow = Transition, Indeterminate, Force
  - Cyan (Light Blue) = Manual Operation
  - Purple = Local Control (HMI displays)
  - Clear = Local Control (local panels)
  
- Switches, motor starters, electrical distribution equipment follow the color scheme found in 24590-WTP-3PS-EKP0-T0001, Engineering Specification Electrical Requirements for Packaged Equipment, Sections 5.1.4.5 and 5.1.5.2
  - Green = Motor is stopped or switch / circuit breaker is open
  - Red = Motor is running or switch / circuit breaker is closed
  - Amber = Motor is tripped

# Software

- Driven by our contract with DOE
- Called for in our Quality Assurance Manual (QAM)
- Applies to:
  - Unique programmed devices
  - Non-Modifiable, Configurable Software
- Software Lifecycle Document
- Compatibility with our Control System

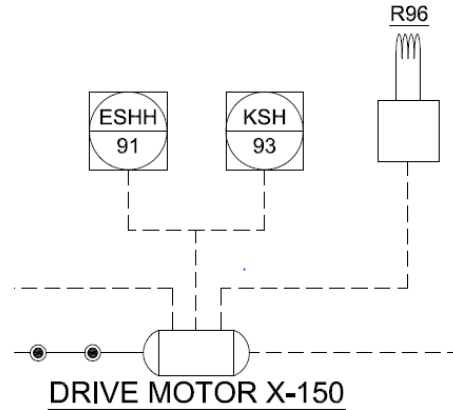
# Vendor Submittals

- The paper is at least as important as the hardware
- Attention to detail
  - Meets the requirement
  - Incorporates the comments
  - Consistent across the order

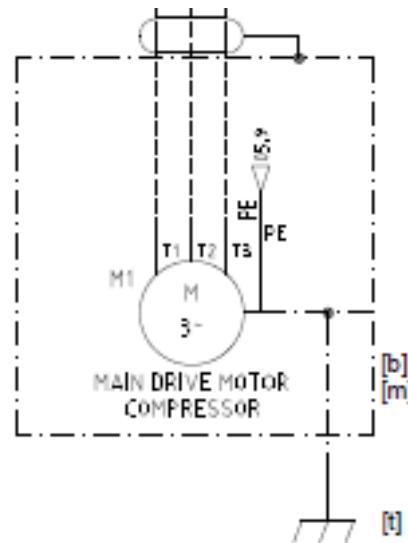


# Example of Lack of Consistency

- P&ID



- Wiring Diagram



# Tagging/Labeling

- Everything must match
- Datasheet – other documents – physical tag
  - Be careful on the front end with the submittals
  - Make sure the physical tag matches - exactly

# Open Topics or More Depth on Material Covered



- Questions/Comments?