



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



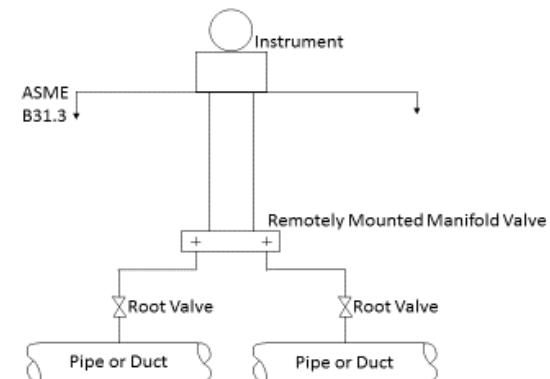
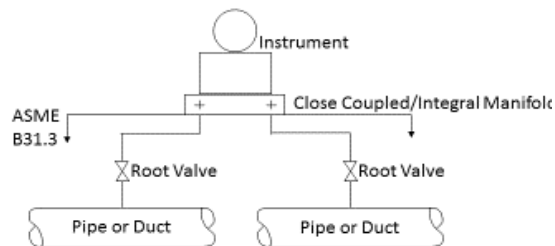
- ASME B31.3 is the Piping Standard for 99% of this project
- What are the alternatives for devices?
 - Unlisted Components
 - At times, Vendor Standards
- When does it apply?
 - When ASME B31.3 says it does
 - Per Section 322.3.1 – ASME B31.3 does not apply to instruments
 - Section 300.2 piping components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

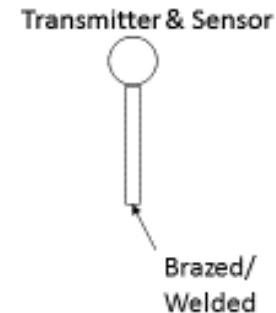
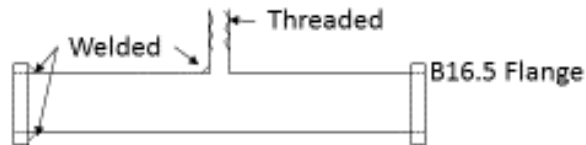


Common Struggles with both Discrete and Packaged Equipment – ASME B31.3



■ Insertion Instruments

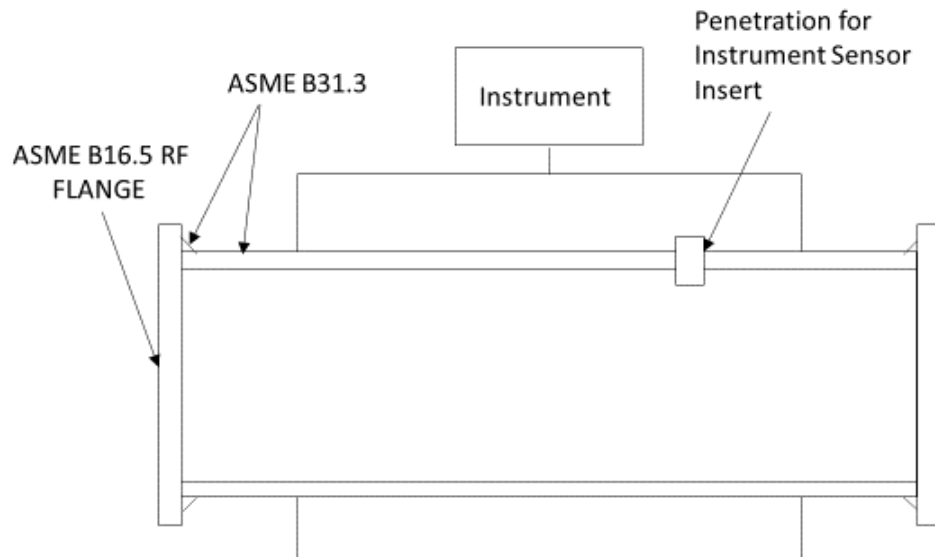
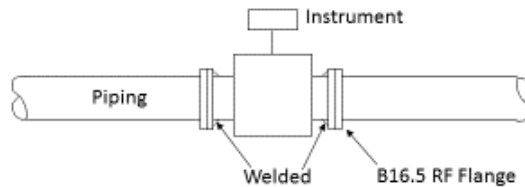
- Example – thermowells, thermal flowmeters, or pitot tubes
- Pipe vs the instrument



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

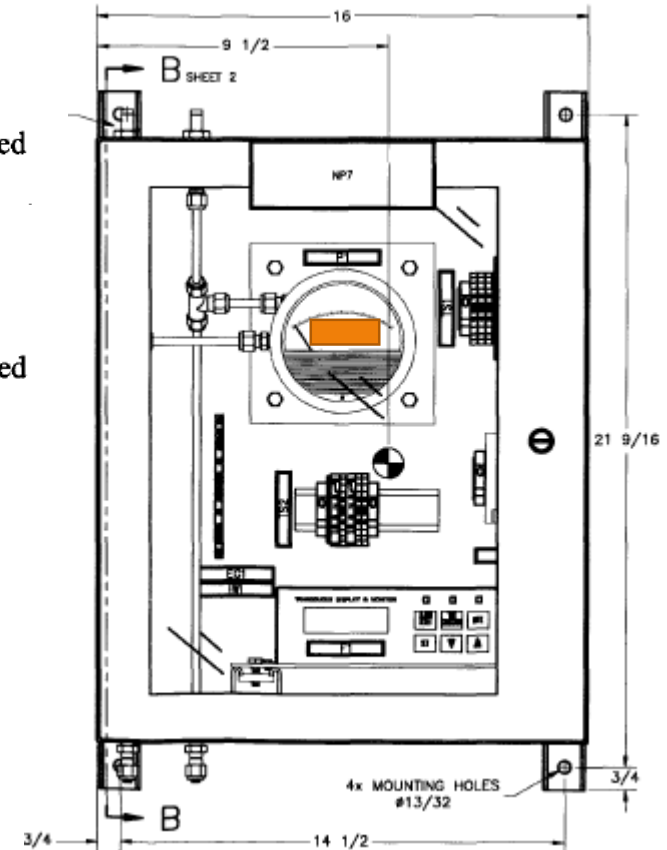
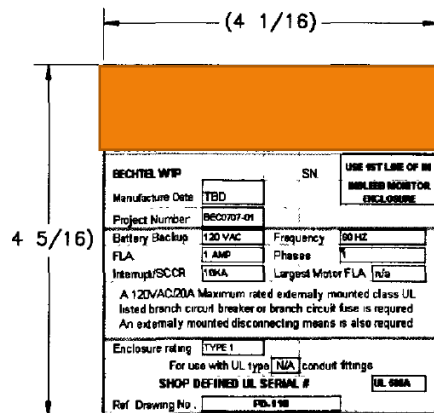
- Indoor use
- Protects personnel
- Protects equipment
 - Solid objects – dirt, dust, fibers
 - Some protection from water dripping and light splashing

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

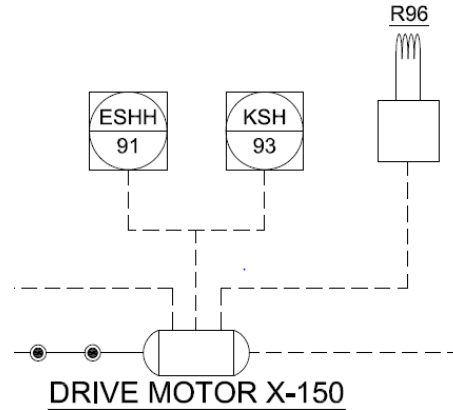
- Driven by our contract with DOE
- Called for in our Quality Assurance Manual (QAM)
- Applies to:
 - Unique programmed devices
 - Non-Modifiable, Configurable Software
- Software Lifecycle Document
- Compatibility with our Control System

Vendor Submittals

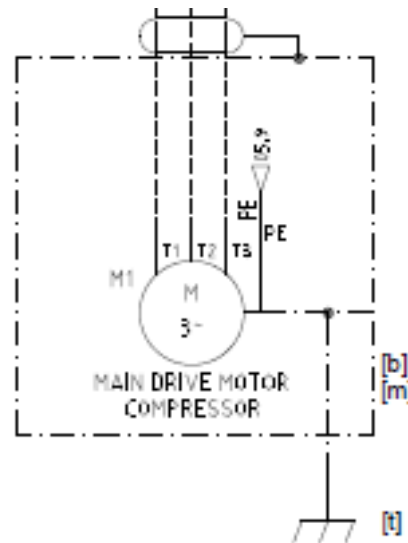
- The paper is at least as important as the hardware
- Attention to detail
 - Meets the requirement
 - Incorporates the comments
 - Consistent across the order

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?