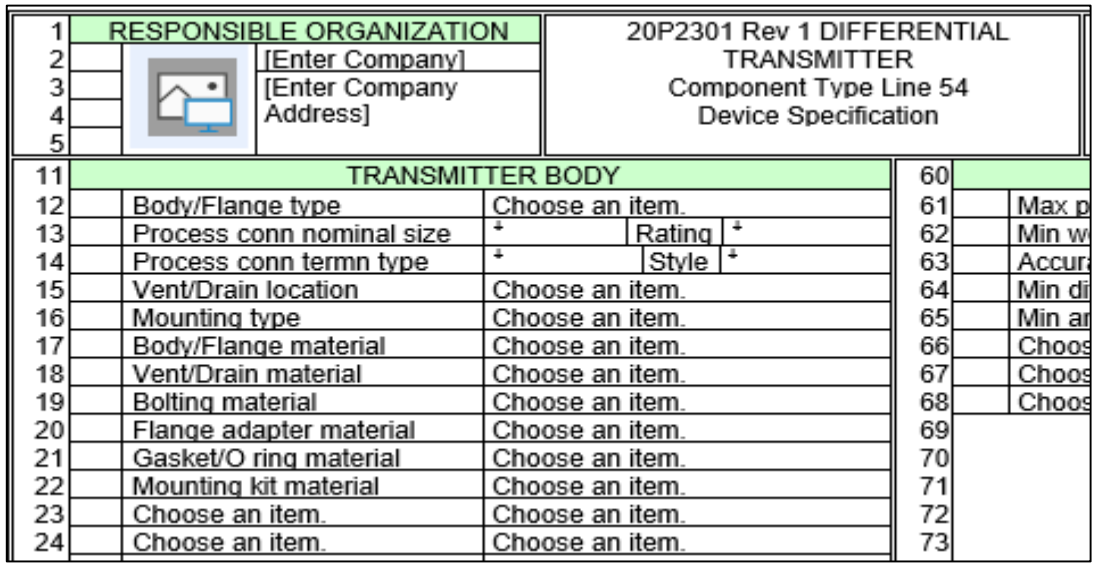
ISDD Presentation

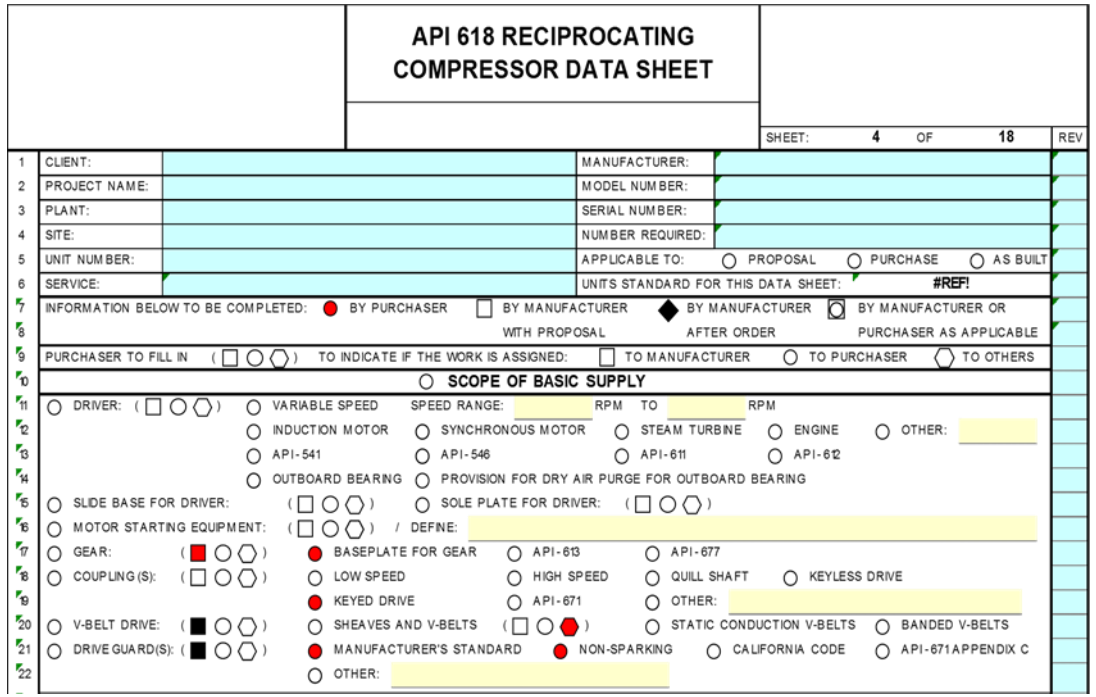
How to Prepare Data Sheets
for Datasheet Definitions

Ron Montgomery



	RESPONSIBLE ORGANIZATION	20P2301 Rev 1 DIFFERENTIAL TRANSMITTER Component Type Line 54 Device Specification
	[Enter Company] [Enter Company Address]	

TRANSMITTER BODY		
Body/Flange type	Choose an item.	
Process conn nominal size		Rating
Process conn termn type		Style
Vent/Drain location	Choose an item.	
Mounting type	Choose an item.	
Body/Flange material	Choose an item.	
Vent/Drain material	Choose an item.	
Bolting material	Choose an item.	
Flange adapter material	Choose an item.	
Gasket/O ring material	Choose an item.	
Mounting kit material	Choose an item.	
Choose an item.	Choose an item.	
Choose an item.	Choose an item.	



API 618 RECIPROCATING COMPRESSOR DATA SHEET

SHEET: 4 OF 18 REV

CLIENT:		MANUFACTURER:	
PROJECT NAME:		MODEL NUMBER:	
PLANT:		SERIAL NUMBER:	
SITE:		NUMBER REQUIRED:	
UNIT NUMBER:		APPLICABLE TO: ○ PROPOSAL ○ PURCHASE ○ AS BUILT	
SERVICE:		UNITS STANDARD FOR THIS DATA SHEET:	#REF!

INFORMATION BELOW TO BE COMPLETED: ● BY PURCHASER □ BY MANUFACTURER WITH PROPOSAL ◆ BY MANUFACTURER AFTER ORDER ⬡ BY MANUFACTURER OR PURCHASER AS APPLICABLE

PURCHASER TO FILL IN (□ ○ ⬡) TO INDICATE IF THE WORK IS ASSIGNED: □ TO MANUFACTURER ○ TO PURCHASER ⬡ TO OTHERS

○ **SCOPE OF BASIC SUPPLY**

○ DRIVER: (□ ○ ⬡) ○ VARIABLE SPEED SPEED RANGE: ____ RPM TO ____ RPM
○ INDUCTION MOTOR ○ SYNCHRONOUS MOTOR ○ STEAM TURBINE ○ ENGINE ○ OTHER:
○ API-541 ○ API-546 ○ API-611 ○ API-612
○ OUTBOARD BEARING ○ PROVISION FOR DRY AIR PURGE FOR OUTBOARD BEARING
○ SLIDE BASE FOR DRIVER: (□ ○ ⬡) ○ SOLE PLATE FOR DRIVER: (□ ○ ⬡)
○ MOTOR STARTING EQUIPMENT: (□ ○ ⬡) / DEFINE:
○ GEAR: (■ ○ ⬡) ● BASEPLATE FOR GEAR ○ API-613 ○ API-677
○ COUPLING (S): (□ ○ ⬡) ○ LOW SPEED ○ HIGH SPEED ○ QUILL SHAFT ○ KEYLESS DRIVE
● KEYED DRIVE ○ API-671 ○ OTHER:
○ V-BELT DRIVE: (■ ○ ⬡) ○ SHEAVES AND V-BELTS (□ ○ ●) ○ STATIC CONDUCTION V-BELTS ○ BANDED V-BELTS
○ DRIVE GUARD(S): (■ ○ ⬡) ● MANUFACTURER'S STANDARD ● NON-SPARKING ○ CALIFORNIA CODE ○ API-671 APPENDIX C
○ OTHER:

ISDD Industry Standard Datasheet Definition

Build and Use Program

(Why Do It

(How to Do It)

Datasheet/Spreadsheet Engineering Use Issues

Constraints & Barriers & complexity

Pump Datasheet Elements Plant Maintenance, Operations

Operations

Category	Number of Elements
Data Sheet Header	10
Drive and Power Train	6
Liquid Characteristics	6
Service Conditions	6
Notes on Pump Design	6
Pump Performance	14
Pump Physical Orientation	22
Pump Casing	2
Case Pressure Limits	6
Rotor Information	3
Coupling Information	8
Notes on Rotating Elements	6

Maintenance

Category	Number of Elements
Pump Materials	4
Pump Bearings	10
Base Plate Information	14
Seal Plans	2
Heating and Cooling	8
Manifold Piping	4
Painting Spec's	8
Maintenance Prep.	4
Safety Limits	25
Manufacturing Tests	10
Welding PMI Inspections	25
As Built Field Tests	31

Datasheet Elements needed 240 per Pump API 610

- Green field project installations still heavily rely on standardized datasheets developed by API, ASME, ANSI, PIDEX, PIP, ISA, IEC, etc. for design and procurement
- Almost all Brown field plants keep important data resident in datasheets/spreadsheet

- Datasheets are *visual documents* with a significant amount of data represented by graphic symbols
- Managing the *number of datasheets* Types, Instances, and the *number of data elements* required per instance become a daunting challenge
- Engineering handover is complicated by datasheets as a storage/system of record especially if there are multiple revisions steps.
- Systems of Record and plant applications requiring initialization becomes very difficult if data is trapped in datasheets/spreadsheets & documents

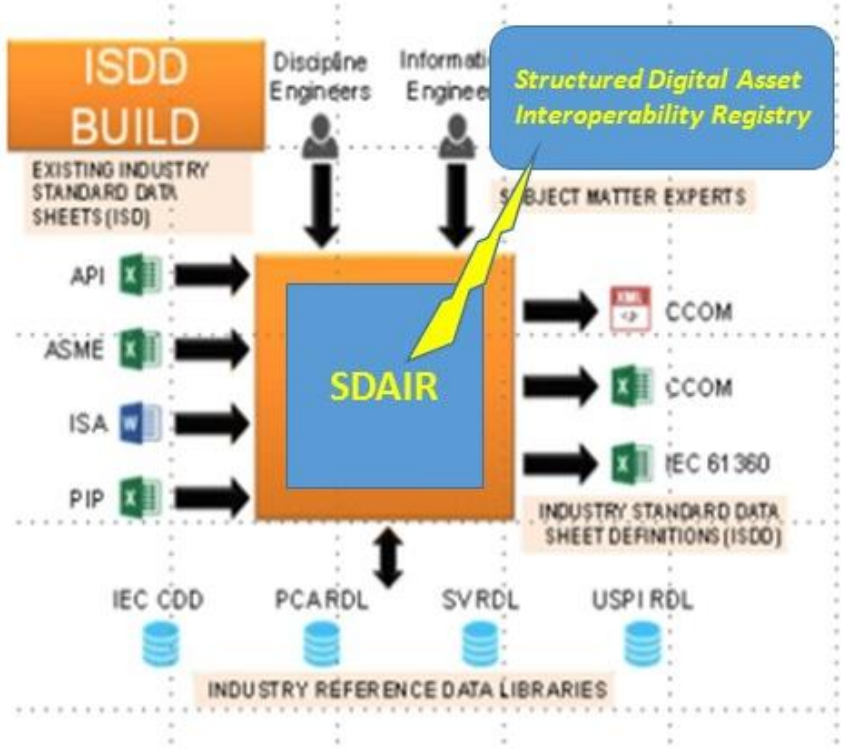
Industry Standard Data Sheets (ISDs)

- Currently we have identified 263 source ISDs in common use
- Most commonly identified ISD publishers are listed below

API	15 (+20 ISO equivalents)
ASME	2 (+1 ISO equivalent)
IEC	10
ISA	166
ISO	28
NORSOK	31
PIP	11

ISDD Build Values and Benefits

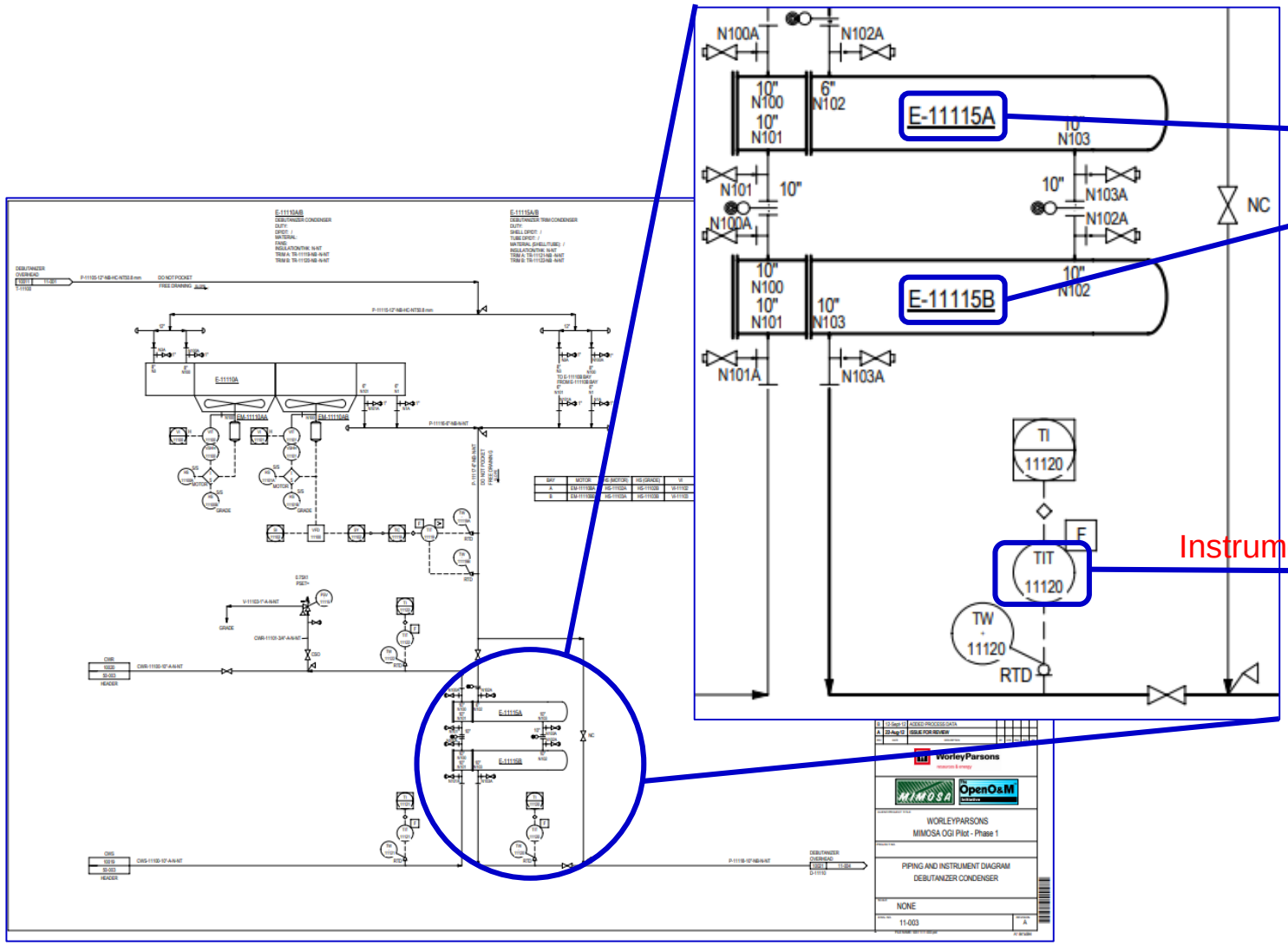
Opportunities Being Addressed



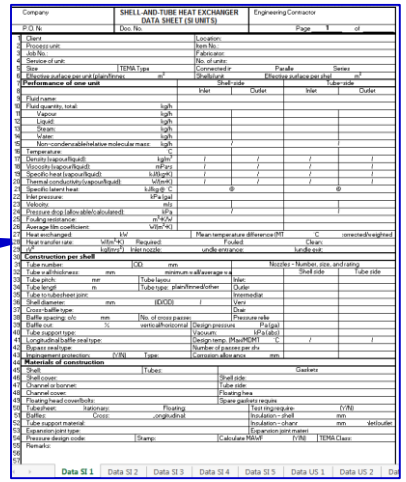
ISDD Build Benefits

- A step-wise conversion process producing single final format for all data sheet types that is the input for the OIIE SDAIR – Standardized Digital Asset Interoperability Register
- A means to define Graphical Symbol logic values utilized in data sheets (Radio Buttons, Rectangles, Check Boxes etc.
- A reliable method for managing Units of Measure – UOM for both SI and US Customary Units leveraging the Energistics UOM source information.

Condenser Unit of Debutanizer Tower P&ID

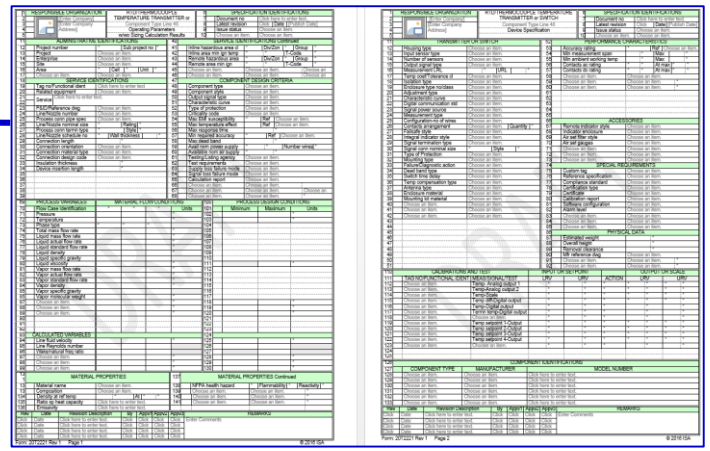


Equipment class ISD



API 660 Shell and Tube Heat Exchanger Data-sheet

Instrument class ISD



ISA 20T2221 RTD/Thermocouple Temperature Transmitter or Switch Revision 1 Data-sheet

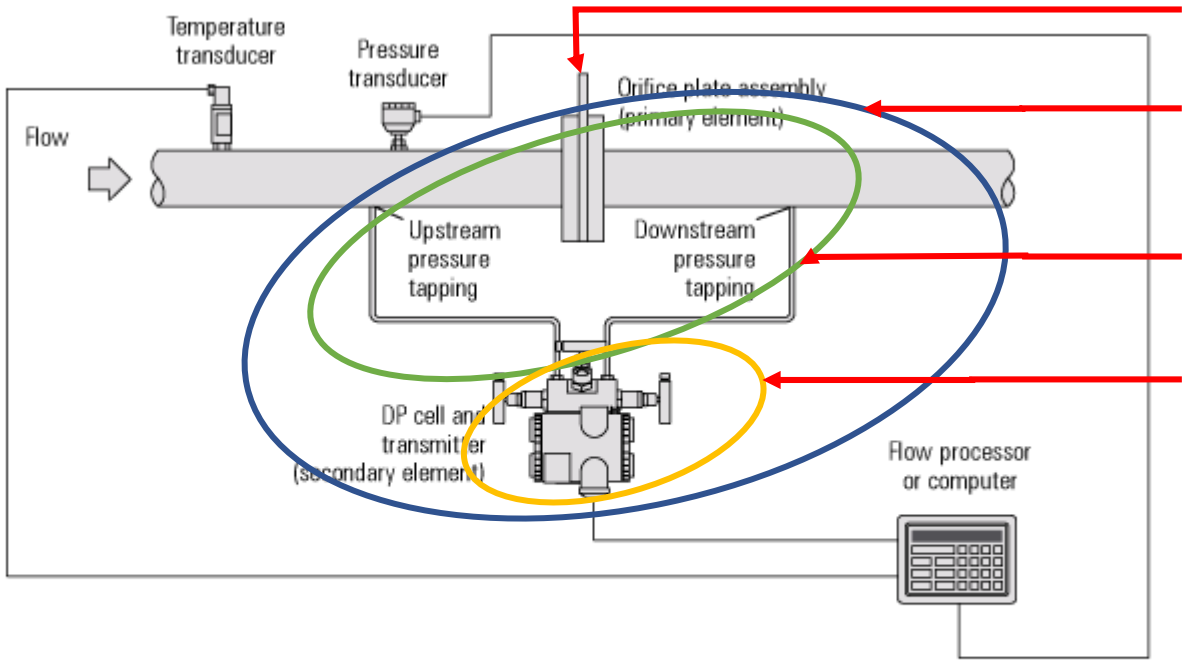


Fig. 4.4.1
A typical orifice plate steam flowmetering station

20F2041 - ORIFICE PLATE ASSEMBLY w/wo METER TUBE--Device Specifications

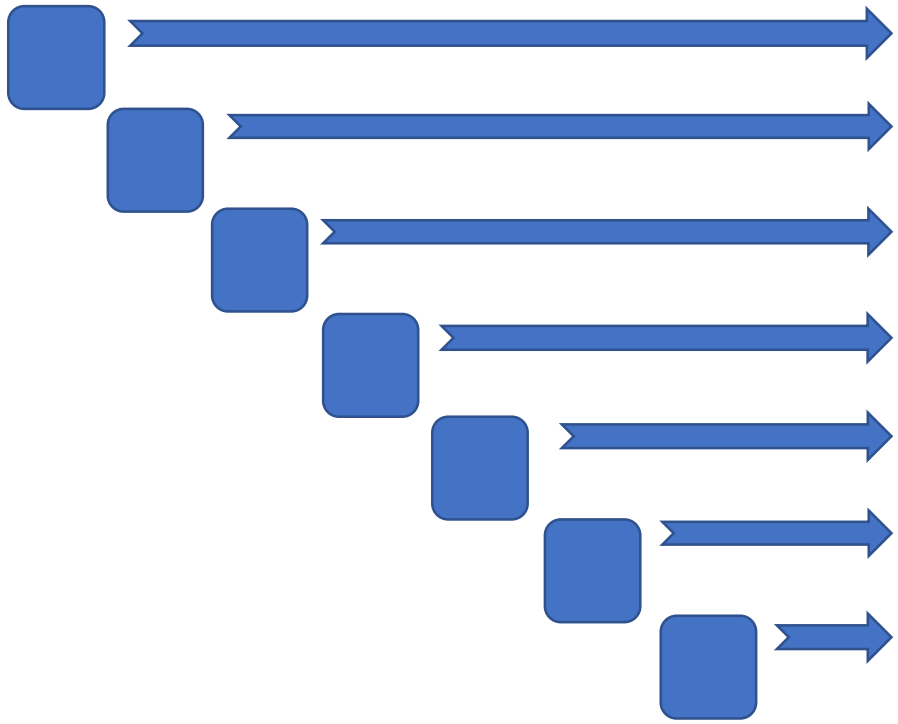
20F1001 - FLOW DEVICE – Operating Parameters

20P1001 - DIFFERENTIAL PRESSURE TRANSMITTER – Operating Parameters

20P2311 – DIFFERENTIAL PRESSURE TRANSMITTER - Device Specifications

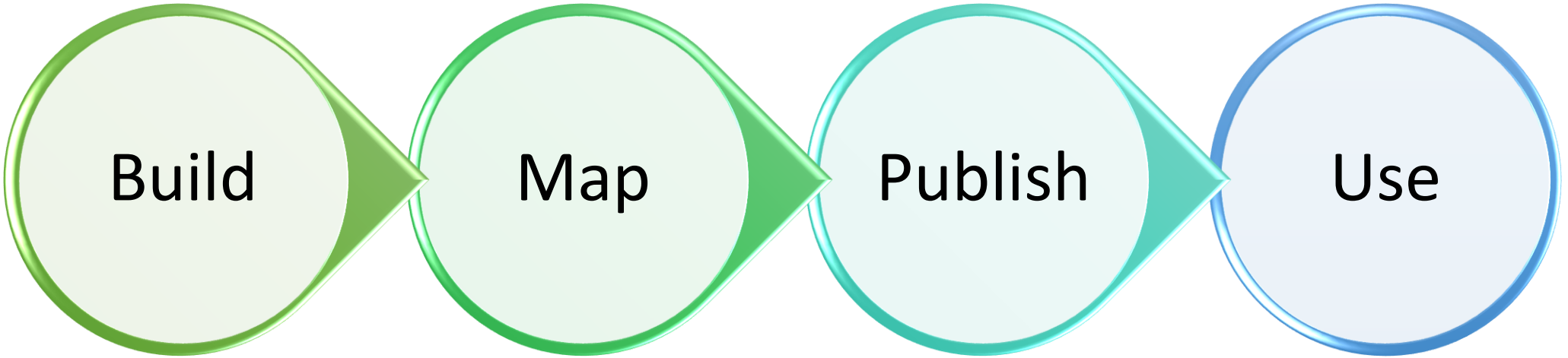
These data sheets comprise all the data to define the functional location of a flow meter installation on a P&ID

Data Sheet To ISDD Load File Processing Steps Until 2017 Was Manual Steps Below



- Mark datasheet elements for loading specific elements
- Data Sheet Preparation Using Tuples (Links variables names to entry area
- Define datasheet blocks areas
- Linearize (decomposes the spreadsheet to single elements on a single row)
- Linearized data sheet page processing
- Assign/Manage Units of Measure - UOM for each data sheet element
- Filter linearized data sheet final format for machine loading

ISDD Phases

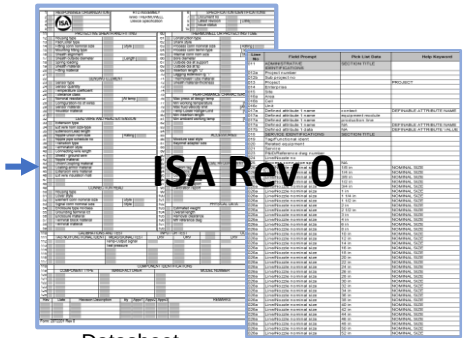


- ISO 15926 PCA RDL
- Energistics Unit of Measure
- MIMOSA CCOM Reference Data
- ISA 20 Picklists
- USPI CFIHOS RDL
- IEC Common Data Dictionary
- ECCMA Open Technical Dictionary

- MIMOSA Website

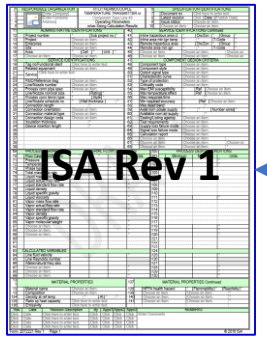
- XML
- Excel
- JSON (Work-in-progress)

ISDD Build Process Automation

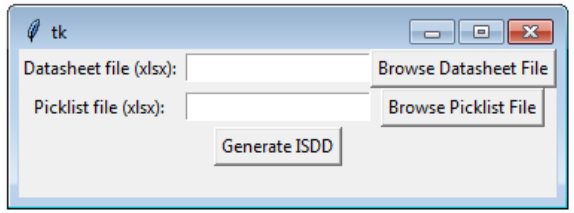


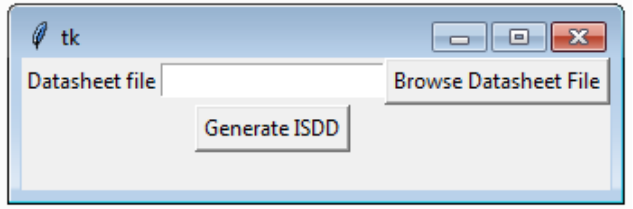
Datasheet

Picklist



Datasheet + Picklist





Visual Inspection

Subject Matter Expert

ISDD

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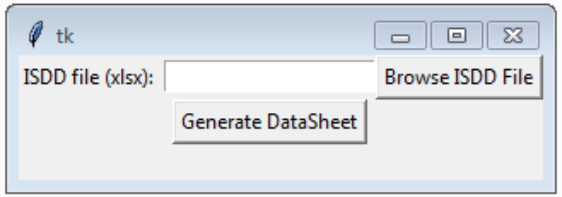
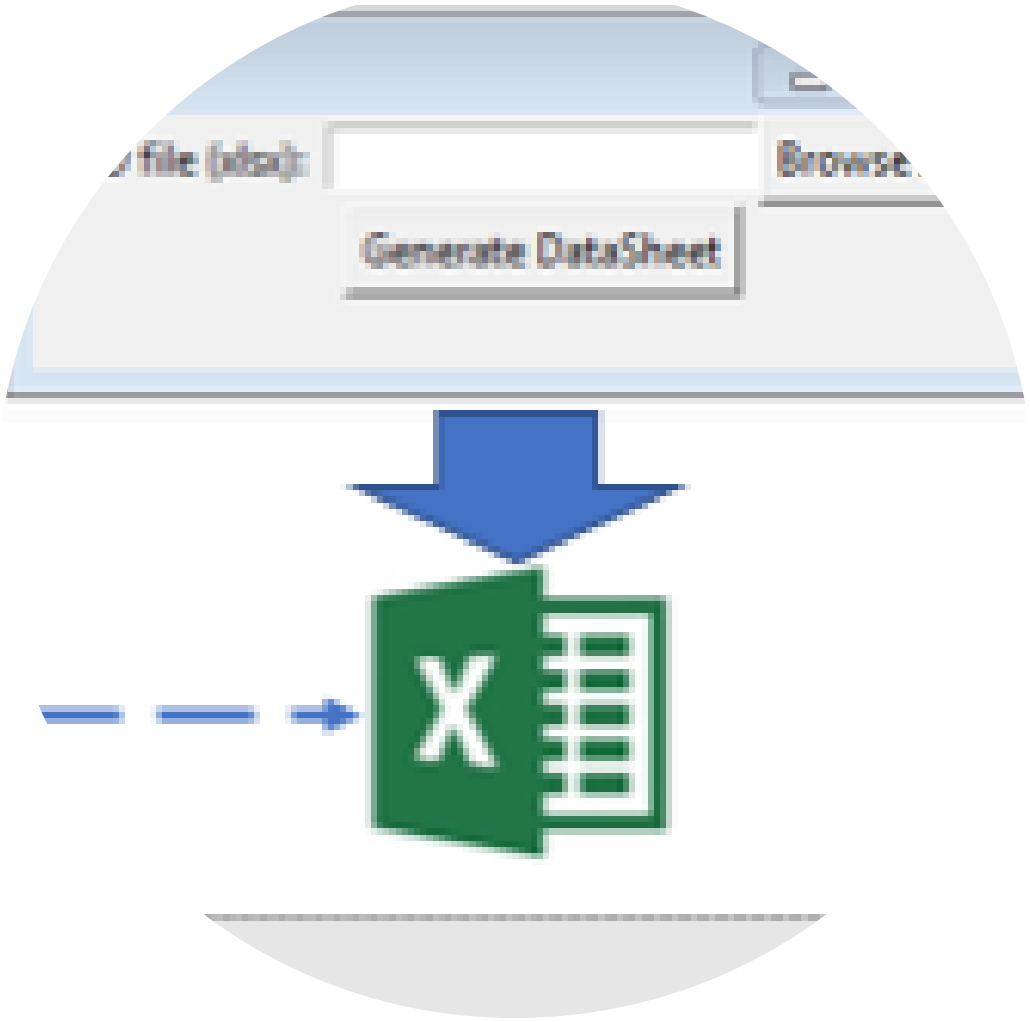
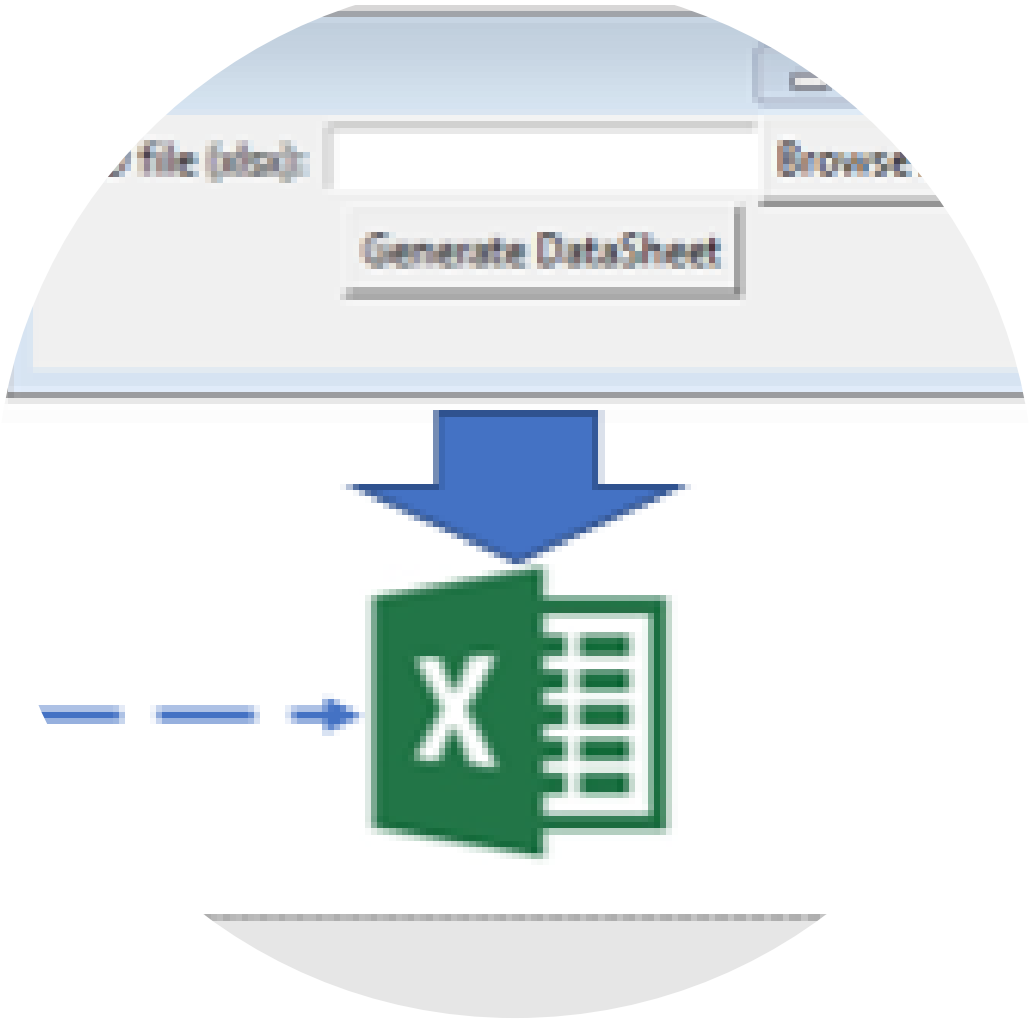
Subject Matter Expert

Visual Inspection



Reverse engineered
1 column datasheet


file (xlsx):
Browse...
Generate DataSheet


file (xlsx):
Browse...
Generate DataSheet

Estimated ISDD Build Process Efforts

- Estimated level of effort per class for ISA and API ISDs
  - ISA-Build ISDDs - 3.5 Hours/Class, Versus
  - Manual-Build ISDDs - 3, 7 or 10 Days/Class/Sub-Class

- Estimated level of effort per class to “convert” CFIHOS classes
  - 2 Hours/class assuming CFIHOS logically correct and consistent
  - Automated conversion with manual QC review

Finish