Supply Chain and Asset Traceability for the Electric Grid

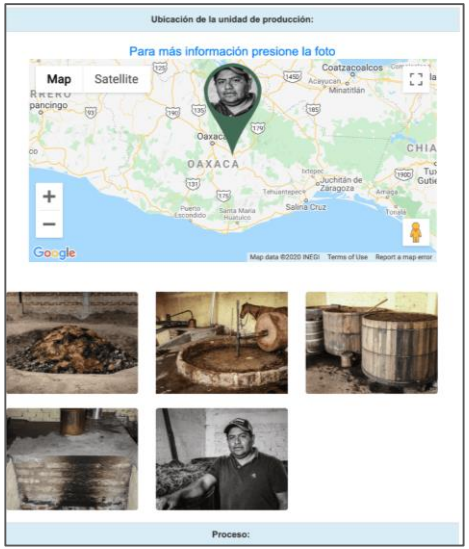
LOCUSVIEW

Berta is a product manager for her family owned Mezcal business in Oaxaca Mexico.

Berta cares a lot about supply chain and asset traceability.

https://www.magueymelate.com

Berta joined a program that created an industry standard QR code that links to a standardized traceability record that includes agave type, lot code, production date, and farmer location to prove authenticity of their product.



Então, por que meu kit de emenda (splice) não tem um código de barras de rastreabilidade?

The core problem is that product data is not available when, where, and how end users need it

Data is delivered from manufacturers in unstructured PDF, excel, etc

Data must be manually transferred from one phase of the asset's life to another

Product data is not available to support real-time decision making

Manufacturer barcodes and QR codes do not contain standardized information

The clean energy transition and the associated electric grid build-out will require utilities and asset owners to maintain high quality systems of record populated with high fidelity data.

Digital Twins, artificial intelligence, machine learning, and augmented reality will not be effective without high quality data.

Smart Tags provide a link between the digital and physical worlds

Digital Thread is a comprehensive dataset of an asset's attributes, based on industry standards, that digitally transfers from one phase to the next from design to decommissioning

Some example use cases . . .

Warehouse

Scan barcode upon receipt to automatically verify country of origin, check expiration date, and get the MSDS

Engineering

Scan barcode on pipe to verify grade and yield strength matches engineering design and BOM

Emergency Response

Scan barcode on transformer supplied through mutual assistance to verify polarity is compatible with system requirements

Construction

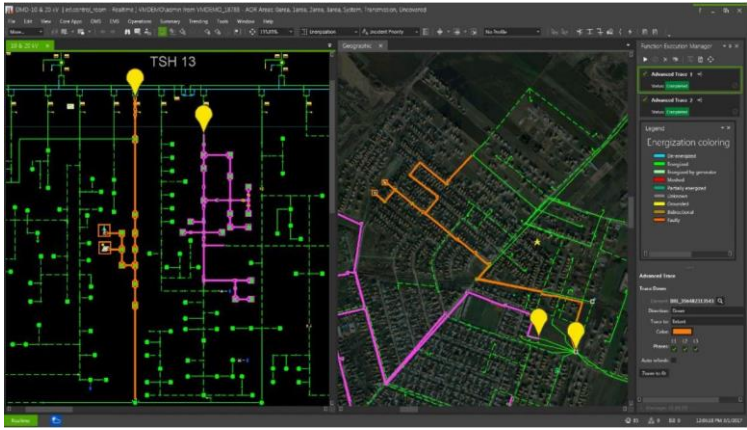
Scan barcode on splice kit to access installation manual, troubleshooting video, and notifications from the manufacturer

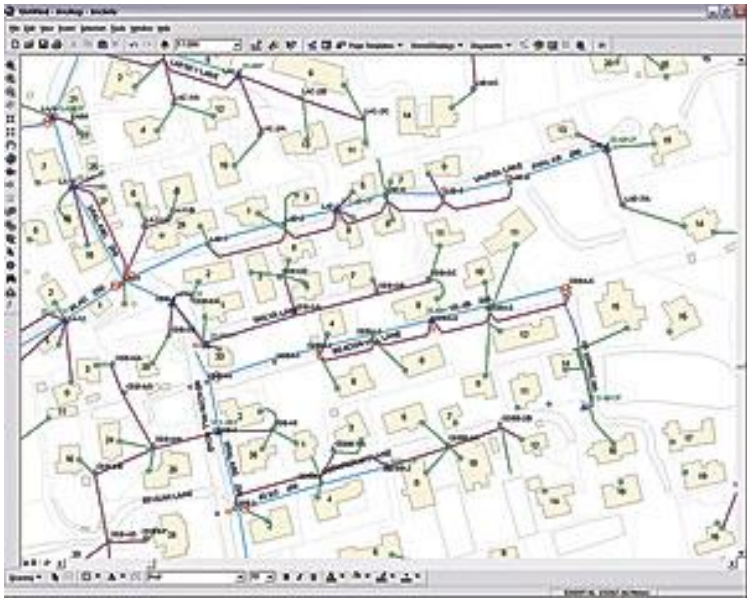
As-Builting

Scan barcode to automatically create digital as-built with asset definitions and attributes

Digital Twin and GIS

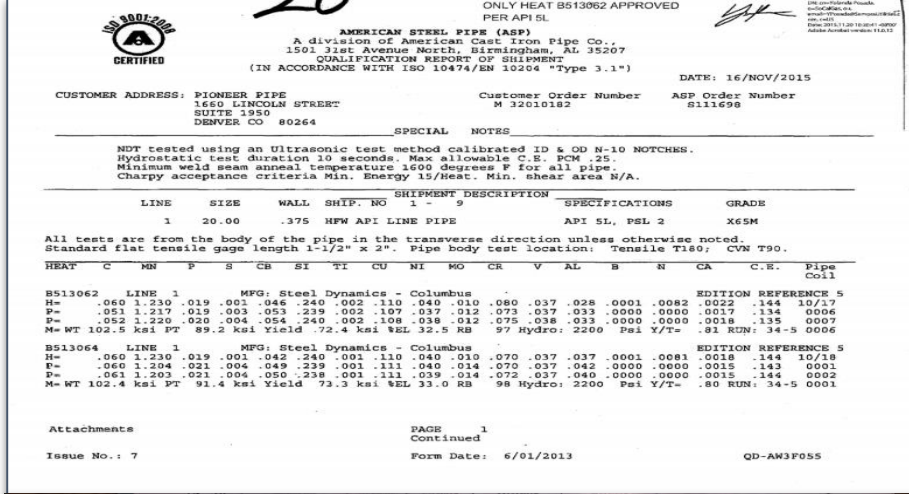
Automatically update GIS and other systems of record with Digital Thread dataset





Project Close-Out

Automatically download digital certificate of compliance data and store data in asset management system



ONLY HEAT B513062 APPROVED
PER API 5L

ISO 9001:2008 CERTIFIED

AMERICAN STEEL PIPE (ASP)
A division of American Cast Iron Pipe Co.,
1501 31st Avenue North, Birmingham, AL 35207
QUALIFICATION REPORT OF SHIPMENT
(IN ACCORDANCE WITH ISO 10474/EN 10204 "Type 3.1")

DATE: 16/NOV/2015

CUSTOMER ADDRESS: PIONEER PIPE
1660 LINCOLN STREET
SUITE 1950
DENVER CO 80264

Customer Order Number: M 32010182
ASP Order Number: S111698

SPECIAL NOTES

NDT tested using an Ultrasonic test method calibrated ID & OD N-10 NOTCHES.
Hydrostatic test duration 10 seconds. Max allowable C.E. PCM .25.
Minimum weld seam anneal temperature 1600 degrees F for all pipe.
Charpy acceptance criteria Min. Energy 15/Heat. Min. shear area N/A.

SHIPMENT DESCRIPTION 1 - 9

LINE	SIZE	WALL	SHIP. NO	SPECIFICATIONS	GRADE
1	20.00	.375	HFW API LINE PIPE	API 5L, PSL 2	X65M

All tests are from the body of the pipe in the transverse direction unless otherwise noted.
Standard flat tensile gage length 1-1/2" x 2". Pipe body test location: Tensile T180; CVN T90.

HEAT	C	MN	P	S	CB	SI	TI	CU	NI	MO	CR	V	AL	B	N	CA	C.E.	Pipe Coil
B513062 LINE 1 MFG: Steel Dynamics - Columbus EDITION REFERENCE 5																		
H=	.060	1.230	.019	.001	.046	.240	.002	.110	.040	.010	.080	.037	.028	.0001	.0082	.0022	.144	10/17
P=	.051	1.217	.019	.003	.053	.239	.002	.107	.037	.012	.073	.037	.033	.0000	.0000	.0017	.134	0006
P=	.052	1.220	.020	.004	.054	.240	.002	.108	.038	.012	.075	.038	.033	.0000	.0000	.0018	.135	0007
M= WT 102.5 ksi PT 89.2 ksi Yield 72.4 ksi %EL 32.5 RB 97 Hydro: 2200 Psi Y/T= .81 RUN: 34-5 0006																		
B513064 LINE 1 MFG: Steel Dynamics - Columbus EDITION REFERENCE 5																		
H=	.060	1.230	.019	.001	.042	.240	.001	.110	.040	.010	.070	.037	.037	.0001	.0081	.0018	.144	10/18
P=	.060	1.204	.021	.004	.049	.239	.001	.111	.040	.014	.070	.037	.042	.0000	.0000	.0015	.143	0001
P=	.061	1.203	.021	.004	.050	.238	.001	.111	.039	.014	.072	.037	.040	.0000	.0000	.0015	.144	0002
M= WT 102.4 ksi PT 91.4 ksi Yield 73.3 ksi %EL 33.0 RB 98 Hydro: 2200 Psi Y/T= .80 RUN: 34-5 0001																		

Attachments

PAGE 1
Continued

Issue No.: 7

Form Date: 6/01/2013

QD-AW3F055

Asset Management

Query GIS to identify the quantity and exact location of a recalled batch of reclosers

Cyber Security

Query asset management system populated with SBOM data to assess vulnerability to a new cyber threat for smart meters with a specific version of an embedded software

Environmental Responsibility

Track the disposal of potentially toxic chemicals and materials

Recycling

Scan barcode to retrieve PV module BOM that includes material content to assess recycling profitability and disposal of toxic metals

Event Tracking

- Track important events throughout the asset's life
  - Manufacturing
  - Fabrication
  - Testing
  - Receipt at warehouse
  - Installation in the field
  - Commissioning
  - Inspections
  - Repairs
  - Decommissioning
  - Disposal, recycling, reuse

- Continuously add data to the Digital Thread

Se vê fantástico . . . como faço para chegar lá?

Supply Chain and Asset Traceability for Electric (SCATE) Program

- EPRI R&D project
- IEEE work group
- Proof-of-concept projects
- Industry standards

IEEE Work Group

- Objectives
  - Define use cases
  - Define critical assets
  - Define attributes
  - Propose standards

- Open to all asset owners and manufacturers

- Kicked off in November 2022
  - Monthly working group meetings

- Send email to SCATE@locusview.com to join

Standards

- CIM Model is a comprehensive industry standard data model for electric grid assets

- GS1 Platform for creating industry standard unique product identifiers and barcodes

EPRI

CIM management

GS1

GS1 Brasil

ASSOCIAÇÃO BRASILEIRA DE AUTOMAÇÃO

Proof of Concept Projects

- Objective
  - Demonstrate value
  - Engage stakeholders
  - Learn early
- Identify relevant existing standards
- Understand which data needs to be encoded in the Smart Tag vs linked through the Digital Thread
- One manufacturer and 1-3 utilities
- Three working sessions to define attribute data model based on use cases
- Implement in GS1 and demonstrate

Cold Shrink Splice Kit POC Team

Splice Kit Barcode Attributes

- Unique Product ID
- Asset Type
- Serial Number
- Manufacturer
- Part Number
- Shelf Life
- Country of Origin

- Applicable Connector Material
- Voltage Class
- Capacitive Test Point
- Connection Type
- Conductor Size
- Maximum Operating Voltage (Phase to Ground)
- Link to MSDS sheet

Success Story from Natural Gas

- ASTM F2897 provides a traceability code for asset type, manufacturer, date, size, material, and lot code

Use cases include:

Regulatory compliance
Digital as-builting
Material verification
Automated project close-out
Automated GIS updating

Full industry adoption in five years

In Summary . . .

Smart Tags provide a link between
the digital and physical worlds

Digital Thread is a comprehensive dataset of an asset's attributes, based on industry standards, that digitally transfers from one phase to the next from design to decommissioning

Obrigada!

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