Managing Massive Updates

Using GIS to Fuel Gas Compliance

Esri User Conference 2015

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Managing Massive Updates – *Using GIS to Fuel Gas Compliance*

Agenda

- Introductions
- Business Drivers
  - *Project Background*
- Business Challenges
- Solution Overview
  - *Process*
  - *Workflow & QAQC*
  - *Additional Challenges*
- Business Benefits

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Introductions

Jill Gehrig | NIPSCO

- Leader of Maps & Records
- PM for the Data Mining Gas Asset Integrity & Pipeline Safety Project
- 39 Years of experience in gas and electric utility industry
- Involved with NIPSCO mapping from Linens to Esri ArcGIS / ArcFM

Skye Perry | SSP Innovations

- Founder & Principal Consultant
- Esri & Schneider Electric Technical Architect
- Began work with NIPSCO in 2004
- NIPSCO was SSP's Founding Customer

esri Partner Network Silver

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Business Drivers

Project Objectives

- Reduce excavation damage driven from incomplete records information
- Achieve continual and sustainable improvement in the quality and content of gas system condition and performance data used for integrity decision making

Project Approach

- Establish a data collection, storage and retrieval framework that defines GIS and Maximo as the primary “Sources of Truth”
- Define the key data element required to fulfill the project objectives
- Migrate existing paper records and disparate data sources to the GIS/MAXIMO framework

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Project Background

The following steps were completed in 2014:

- Initial Planning and Scoping Effort
- Source Data Matrix
- Data Model Changes in Test Environment (GIS)
- Conversion Specification
- GIS Sessions Cleanup
- GIS Transmission Main Centerline Rectification
- Selection of Data Vendor to Digitize Data from Linens into GIS for entire service territory

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Business Challenges

Data Vendor will apply edits to the following GIS record types:

- Gas Main Locations
- Abandoned Gas Main Locations
- Controllable Fittings
- Non Controllable Fittings
- Drips
- Gas Valves
- Pipe Changes (based on WO/Material/etc.)
- Regulator Stations
- Vertical Pipe (aka Risers)
- Dimensions
- Foreign Utility Lines
- Gas Main
- Gas Pipe Casings
- Service Lines
- Crossings
- CP Circuits
- Excess Flow Valves
- Various Relationships between features

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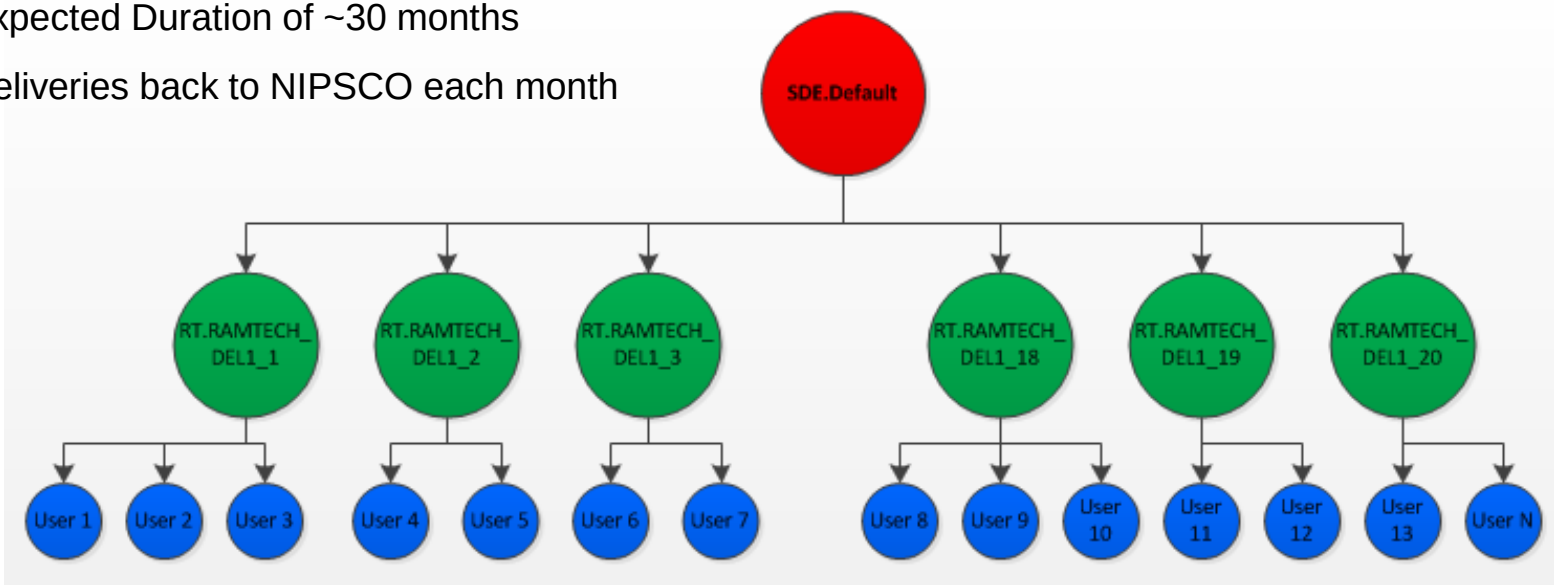
Business Challenges

Data Vendor will create up to 20 versions per Month

- Working in a copy of the NIPSCO geodatabase
- Up to 40 Data Vendor editors in India
- Desire to work without ArcFM
- Expected Duration of ~30 months
- Deliveries back to NIPSCO each month



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Business Challenges

High Volume of External Data Vendor Edits + High Volume of Ongoing Internal Edits

- Production Updates Cannot Stop
- Need a Process to Merge Data Vendor Edits into Production GDB
- Need ArcFM AutoUpdaters and QAQC Validation to Fire
- Need to pass all pertinent updates back to Maximo Asset Management via existing interface
- Need to do it all while minimizing any production downtime

A True Challenge of Massive Data Updates and Moving Parts…

Engaged SSP Innovations to assist

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Solution Overview

SSP Proposed to Use Existing "SSP All Edits State 0 Technology"

- Used with other utilities to extract all versions in a geodatabase
- Allows for compress to state 0 for any activities requiring state 0 including dropping the network
- Automatically recreates all geodatabase versions from scratch
- Re-synchronizes all ArcFM Sessions and Designer Designs
- System comes back online as if versions were intact the whole time

New Process Created as the "SSP All Edits Replay"

- Versioned Edits extracted from Data Vendor's copy of the geodatabase each month
- Automatically replayed into ArcFM Sessions over a weekend each month
- Replayed with ArcFM AutoUpdaters On
- Sessions reviewed and posted per normal QAQC
- Maximo Interface Enabled for all Assets

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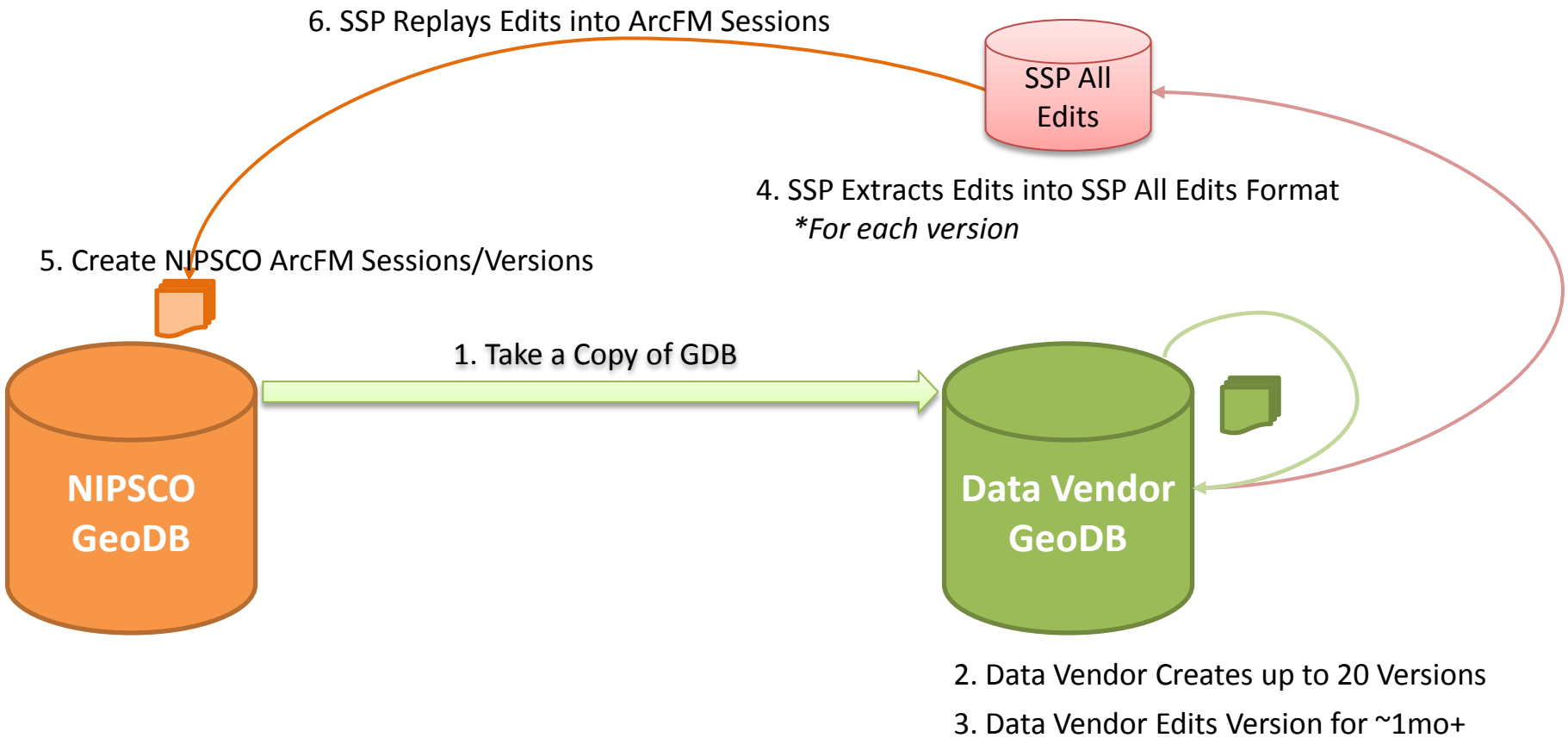
Solution Overview - Process



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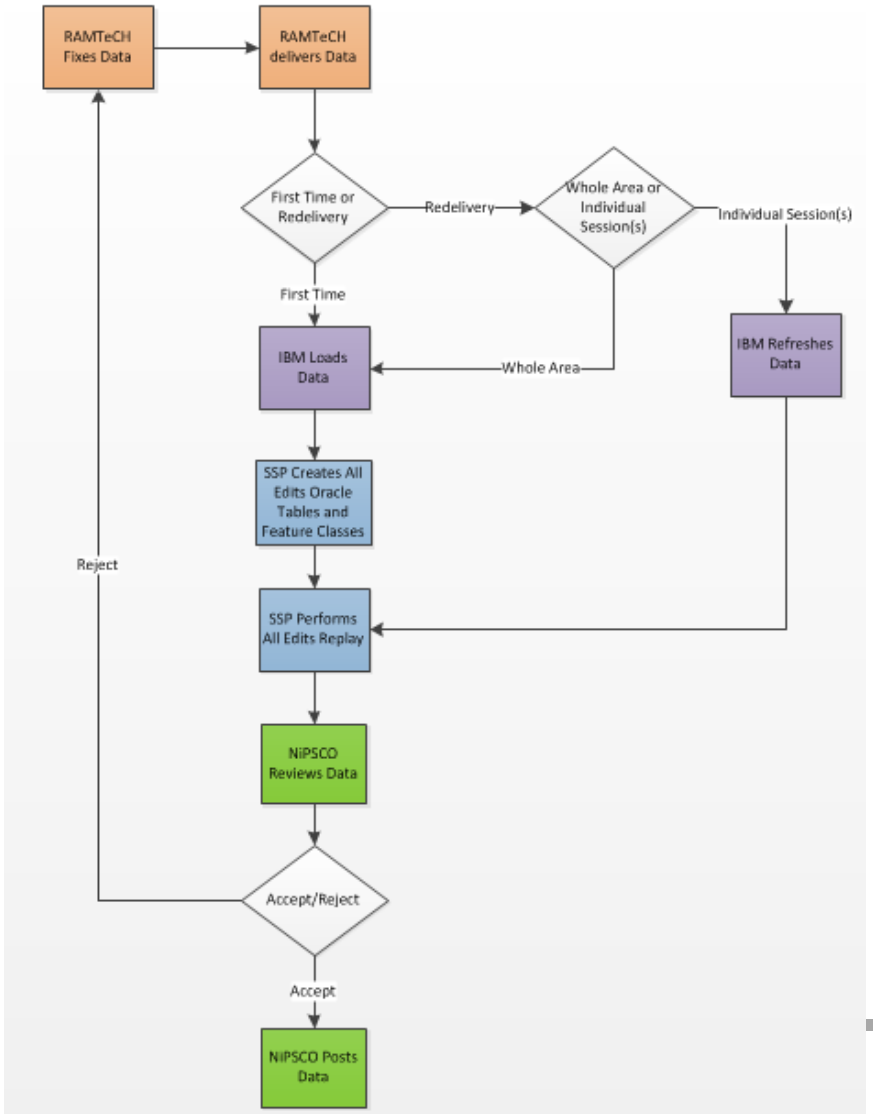
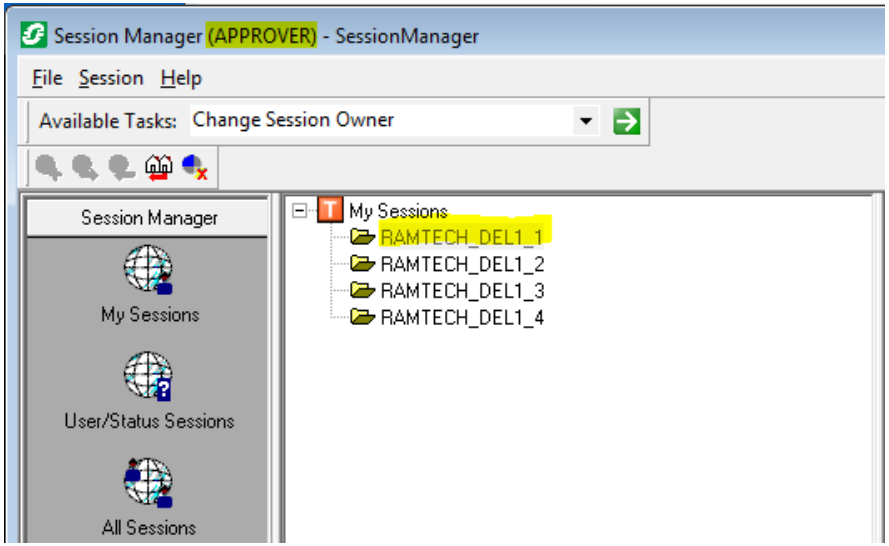
Solution Overview – Workflow & QAQC





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Solution Overview – Additional Challenges

The following Issues Arose During The Project:

- Maximo interface was too slow to handle the volume of edits over a weekend
  - Expected time was 24-30 hours of processing
  - The interface was refactored resulting in an improvement of 5000%
- Additional QAQC Reports Desired to Drive Faster Review
  - Reports being developed on “before” and “after” data elements
  - Validates NULL attribute values now populated and number of features created by Data Vendor

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Business Benefits

The following Technical Benefits Have Been Achieved:

- Pulling a Version When Needed (Just In Time) Reduces Performance Impact on Production]
- Allows NIPSCO to Review the Edits Prior to Posting
- Allows Maximo to be Updated Per Each Data Vendor Edit
- Allows Edits to be Applied as if an Editor Applied the Edit in Real Time
- Edits Are Applied en masse to Production Allowing for the Process to be Closely Monitored
- Allows Data Vendor To Edit without Any ArcFM Technology in Place

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Business Benefits

The following are Benefits of the Overall Data Mining Project:

- Elimination of widely dispersed and disparate sources of asset condition and performance information
- Reduction in excavation damage due to inadequate data
- Improved efficiencies in collecting data to support risk assessments…and subsequent increased awareness of all threats and risks to pipeline safety
- Enables linkage between Asset Health and Condition, Risk and Capital Investment / O&M Spending Portfolio optimization
- Efficient integration of enabling IT Platforms (e.g.; GIS and MAXIMO)
- Streamlined asset data retrieval, dissemination and storage practices for Field personnel

Clearly understood and communicated "single source of truth"

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Wrap Up

Questions?

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