

An Automated Earthquake Notification System for Increased Safety

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Business Case

Solving the Problem

- Slow response time to Colonial's Emergency Operations Procedures (EOP) for seismic activity
- USGS feed displayed in enterprise web map, but required manual monitoring
- Process required a non-automated e-mail notification of field personnel when an earthquake met EOP conditions was reported by an USGS website
- This was time consuming with the potential for an earthquake to go unrecognized for too long

Technical Solution

Evolving to Automation

- Colonial teamed with LOGIC Solutions Group
- Create a fully automated system to evaluate the USGS feed every minute
- Identify each event located within 1-mile and 200-mile distance from pipelines and facilities
- Automatically notify specific personnel in control center and the field, based on geographic area of responsibility

Earthquake Tracker

Data

- USGS RSS feed as a GeoJSON URL
 - Contains one month of earthquakes
- Pipeline Buffers as GeoJSON files
 - 1-mile and 200-mile buffered geometries of the pipeline
- Pipeline and Facility feature classes
 - Colonial's pipeline and facility geometries are read from a UPDM feature class

Earthquake Tracker

Process

- Earthquakes within 200 miles of Colonial's pipeline system are recorded and notified based on these conditions:
 - M 2.0 or greater within a 1-mile buffer recorded with a red icon
 - M 7.0 or greater within a 200-mile buffer recorded with a red icon
 - M 3.5 to M 6.9 within a 200-mile buffer recorded with an orange icon
 - Nearest line number and distance to the epicenter are recorded
 - Other impacted assets
- An email notification based on a pre-defined template is sent for red and orange icon attributed earthquakes
- Values are recorded in a UPDM feature class
- The process to check for newer earthquakes runs every minute

Earthquake Tracker

Results

- USGS Earthquakes as UPDM table
 - A catalog of USGS earthquakes, recorded in a UPDM table called USGSQuake_RSS
- EarthquakeEOP feature class in UPDM
 - Earthquakes meeting the criteria are recorded in the EarthquakeEOP feature class in UPDM
- Other impacted Assets

Earthquake Tracker

Email Notification

Earthquake Notification via Colonial Scout

Today at 12:14 PM



SAMPLE EMAIL ONLY
Earthquake data is not real

Colonial Scout Quake Tracker Alert!

Colonial Scout Quake Tracker has identified an earthquake indicated ORANGE near a Colonial pipeline. EOP entry conditions have been met.

**Contact Engineering Services
for further guidance.**



[Review in Colonial Scout](#)

Sent from the Colonial Scout Quake Tracker notification system based on the EOP for natural disasters.

Earthquake Notification via Colonial Scout

Today at 1:24 PM



SAMPLE EMAIL ONLY
Earthquake data is not real

Colonial Scout Quake Tracker Alert!

Colonial Scout Quake Tracker has identified an earthquake indicated RED near a Colonial pipeline. EOP entry conditions have been met.

**Shutdown all affected
pipelines and contact
Engineering Services for
further guidance.**

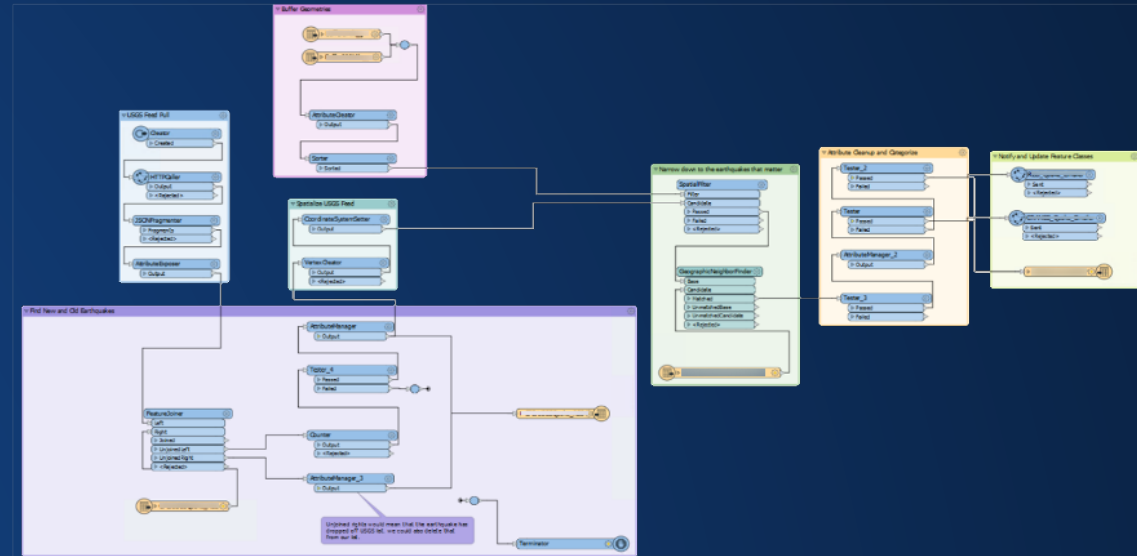


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Technology

- Safe Software's FME - Workbench
- FME Server Scheduler
- Esri's ArcGIS Enterprise



Earthquake Tracker

Business Impacts

- Increased safety – Field personnel notified almost immediately and can take action
- Compliance – Automation provides assurance of compliance with written procedures for seismic hazard mitigation. Allows process to be easily improved and tracked
- Reusability – Results can be displayed in corporate dashboards and shared with web maps used by emergency response teams