Fast Analysis Infrastructure Tool

The National Infrastructure Simulation and Analysis Center (NISAC), a program under the Department of Homeland Security's (DHS) Infrastructure Protection/ Risk Management Division (IP/RMD), provides advanced modeling and simulation capabilities for the analysis of critical infrastructures, their interdependencies, vulnerabilities, and complexities. These capabilities help improve the robustness of our nation's critical infrastructures by aiding decision makers in the areas of policy analysis, investment and mitigation planning, education and training, and near real-time assistance to crisis response organizations.

NISAC is a partnership between Sandia National Laboratories (SNL) and Los Alamos National Laboratory (LANL), integrating the two laboratories existing expertise in modeling and simulation to address the nation's potential vulnerabilities and the consequence of disruption among our critical infrastructures.

Support for NISAC Fast Turnaround Analyses

A central component of NISAC's capability set is the ability to answer questions of interest in a rapid fashion. Developing capabilities that support, enhance, and accelerate this capability is a central mission to NISAC developers. The Fast Analysis Infrastructure Tool, or FAIT, is one of those tools.

Fast Analysis Infrastructure Tool Purpose

The purpose of FAIT is to provide NISAC's Fast Turnaround Analysis team, and ultimately, NISAC end-users, with:

- Information on infrastructure assets, including their interrelationships with other infrastructure assets, based on logically defined relationships among infrastructure asset classes;
- The ability to access knowledge elements related to asset relationships, asset types, specific assets, and specific relationships;
- The ability to access relevant information from other Knowledge Management tools, and other information sources external to those built into FAIT;
- The ability to edit and annotate the logical relationships, knowledge elements, and other relevant information;
- The ability to save and retrieve information about an asset that has previously been analyzed; and
- Delivery of the above-described information in a standardized, natural language-based format that is easily sharable through other Knowledge Management tools or email.

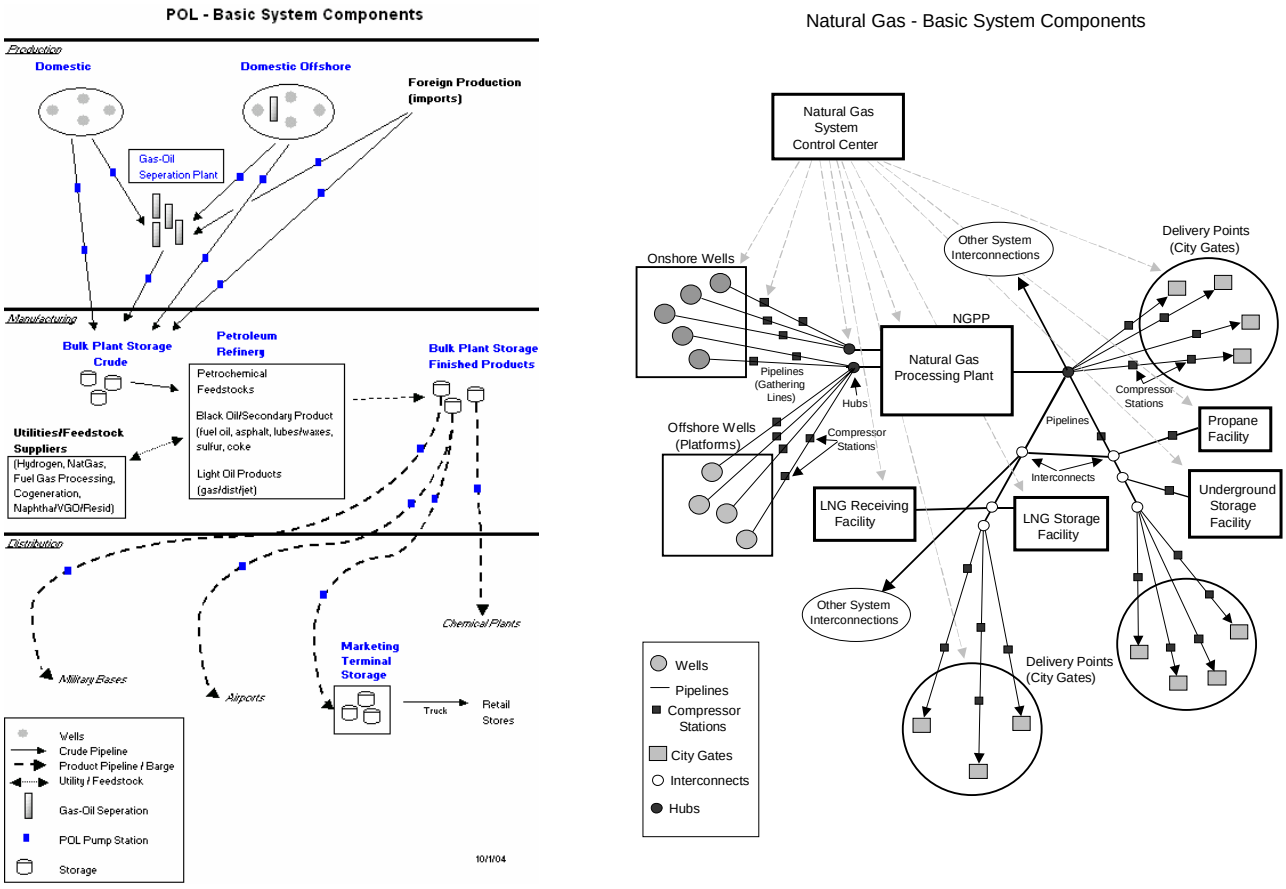
FAIT's web accessible user interface is designed to allow the user full access to the tool's underlying capabilities.

Nature of the Interrelationship/Co-Location Model

At the core of the FAIT capability is an understanding, at the fundamental level, of the relationships between one infrastructure asset and assets in all infrastructures.

This process begins by identifying, with the aid of systems experts for each sector, the set of assets within that sector for which spatial data should exist. Within that sector, a connectivity model is developed, defining the existence of relationships between infrastructure assets. Cases, based on specific metadata that should be available about the asset, are then developed to attempt to define all the possible means of connectivity. For example, an electric power generation facility might have a particular case based on fuel type. If the fuel type is coal, there are multiple means of delivery (mine mouth operation, rail, or barge), each with its own interdependency (local power, rail infrastructure, water transportation infrastructure) which must be examined to determine the most likely application for the case. In a similar fashion, co-location of assets can be analyzed based solely on the available spatial data valuation.

These sector-based connectivity models are then enhanced to include an understanding of the importance of the connection, and the scale of the time delay involved in a disruption.



Connectivity models describe the assets in each sector and their relationships.

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