



Contribution ID: 184

Type: **Contributor (Panel Session)**

Developing a Tool for Acquisition Path Analysis and Strategy (TAPAS)

Wednesday 7 November 2018 11:41 (1 minute)

Acquisition Path Analysis (APA) is the key element in developing a State-level approach. Based on the State's nuclear fuel cycle and related technical capabilities the APA generates a list of acquisition paths ranked by their attractiveness for the State. Based on this, the Agency establishes the technical objectives and identifies the safeguards measures for a State.

A standardized, transparent and reproducible approach for conducting the APA will help ensure consistency and non-discrimination in safeguards implementation at the State level. Therefore, the authors proposed a formal approach, using a three step methodology: network modeling, network analysis and strategic assessment. First, the process starts with considering nuclear fuel cycle and related technical capabilities of the State to obtain the edge weights of the network. Second, the network is analyzed by enumerating all acquisition paths sorted in order of attractiveness for the State. Third, game theory is used to model the decisions made by the IAEA and the State. As a solution, a Nash-equilibrium can be found that provides an indicator on the effectiveness of the implemented safeguards system.

While this approach was implemented as a prototype software, the given paper presents a concept as well as a first working draft for an improved software implementation, using the web framework Django. By means of database techniques, it is ensured that multiple users can access and modify data without loss of data integrity. Furthermore, a user concept will be presented which guarantees a fit to purpose identity and rights management. It will be shown that the software is capable of:

1. Data administration of all entities in the class diagram,
2. Modelling acquisition networks by assessing the attractiveness of each process step and
3. Calculation and visualization of all paths of an acquisition network.

Which "Key Question" does your Abstract address?

TEC3.4

Which alternative "Key Question" does your Abstract address? (if any)

SGI1.2

Topics

TEC3

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Session Classification: [TEC] Visualization for Information Integration

Track Classification: Leveraging technological advancements for safeguards applications (TEC)