

Human Behavior and Energy

(brief insight)

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Human Factors

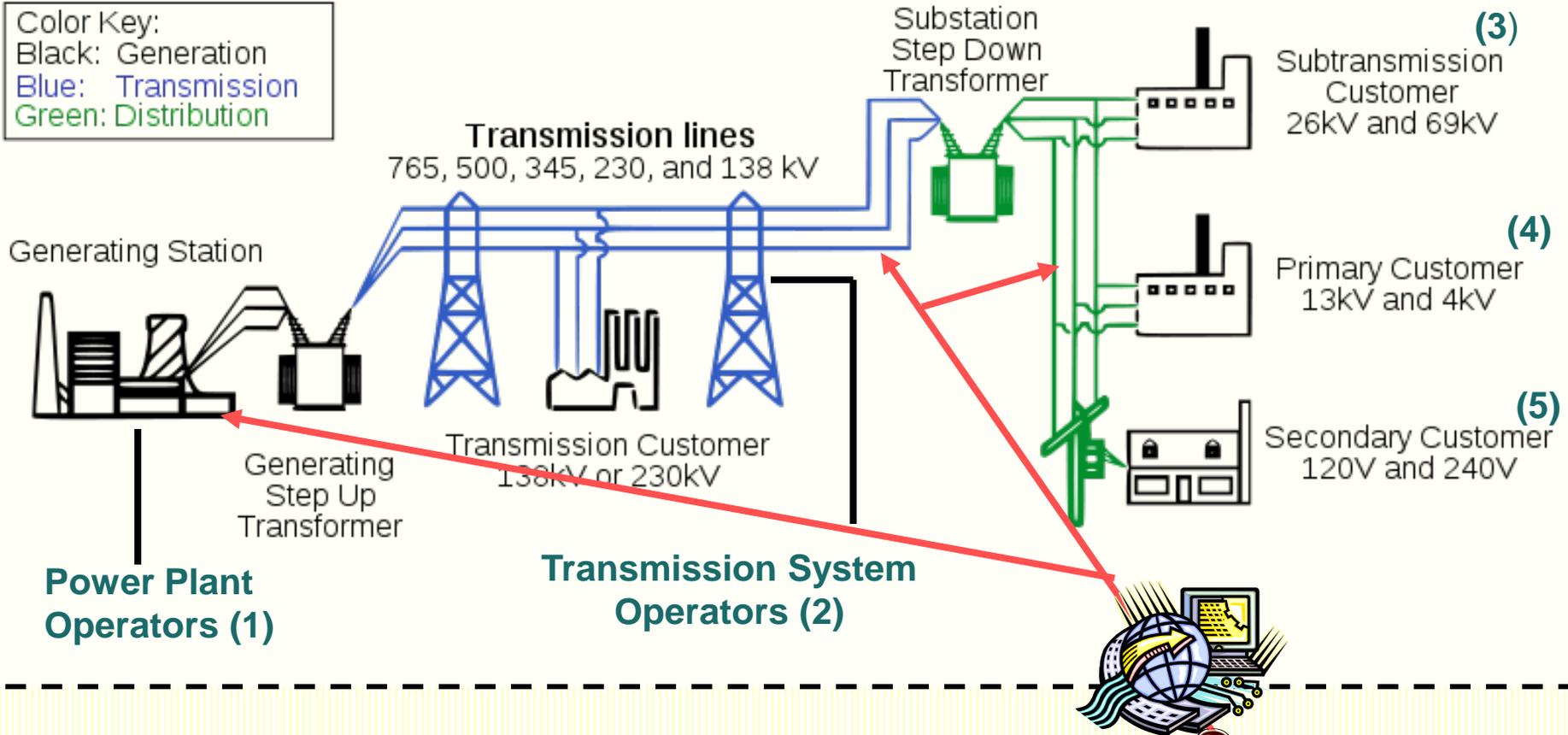


Diagram of Electric Grid

http://en.wikipedia.org/wiki/Electric_power_transmission

foreign
nationals



Human Issues

- Address three “human” areas regarding Energy
 - Consumer Demand
 - Operations
 - Human Interoperability for Information Sharing, Messaging, and Flow Connectivity for (near) Real-Time Responses in Influencing Behavioral Changes

Human Behavior

- The nation's power grid is dangerously antiquated; thereby, becoming a serious liability to the nation's critical infrastructures, and as such, **human behavioral change** is a critical aspect to how we operate, use smart devices and re-evaluate our campaigns to consumer.
- Re-evaluation of use of nuclear power, cold fusion generators, solar and wind turbine systems, advanced wind solar hybrid systems, smart devices and consumer consumption, and so on.

Human Behavior

(continued)

- **In the end**, there is a strong need for a thorough understanding of the intricacies of the human perceptions as it pertains energy,

- cognitive and cultural biases
- cultural programming
- rules and procedure
- merger of these patterns with detection technology for innovative insights of current situational awareness
-

and the how we influence behavioral change

Human Behavior

(continued)

- We accomplish this by leveraging past and current studies that reveal such results as:
 - Baselines of where we are and what we know.
 - What is the current consumer demand and how will new paradigms affect the current energy systems, e.g., social system networking and social media technology.
 - **Government and Independent Campaigns** perceived by users as burdensome, untrustworthy, or too difficult to implement and therefore the user ignores or misinterprets what is expected of them in changing their behaviors for operational or conservation use.

Human Behavior

- (continued)

- An understanding that the **the individual** is key in reducing demand and changing cultural behavior in use of energy.

- ❖ individual + individual^{Nth} → group^{Nth} → organization....

- ❖ Each element of the expression are affected by **cultural imprinting** that form the **cultural programming and criteria** of how people use energy.

- The campaign must start within the schools, the work place, across social networks, in public environments and within our media.

Behavioral Patterns

Few Key Behaviors

- In utilizing such venues as social media technology, there exist **no physical or ethical boundaries per the collective consciousness that the social system network constructs.**
- The boundary of ambiguities of cyberspace is seen as an insulation, and therefore, can be utilized to its full extent to influence behavior.
- Issues of ethical adaptability, loyalty issues to organization, feelings of entitlement and ownership, enmity at authority are different in that we can leverage these elements to reach larger audiences with a stronger positive feedback.

Behavioral Patterns

Few Key Behaviors

- Understanding the feedback of the target audience is crucial.
 - Typically the planning and execution of campaigns are explicitly detailed with a narrow scope of the larger picture, and thus, the loss of sustainability of the campaign.
 - Lack of understanding of economic impact, beliefs and values, cognitive saturation, and human territorial maps of reality produces unwanted, limited, or unsustainable results.
 - Iteration of campaigns every 10 years.

Utilities and Consumers

Demand on the Grid

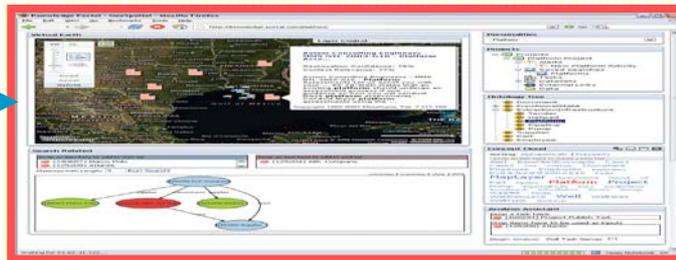
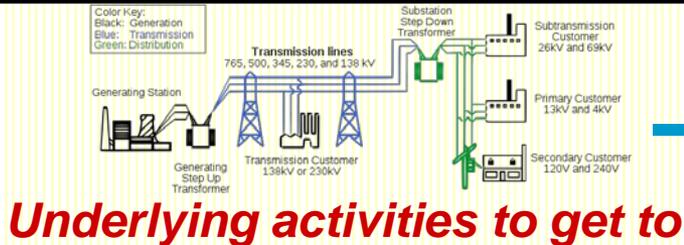
- Demand by users on the Grid is such that reduction in usage with smart devices or technologies doesn't equate to better efficiency of the overall system since the feedback responses that might lead to changes in consumer behavior is not in real-time - roughly 24 hour turn around.
- Utilities are selecting networks that provide connections that are **far from** real-time feedback responses to the consumer. The decision is based on keeping consumer costs low, while striving to compete in operating at maximum efficiency.
- In the end, a major key factor in keeping the Grid functioning at an energy **level efficiency** that is required by our critical infrastructures, businesses and security is the **changing of the consumer's human behavior**.

Utilities and Consumers

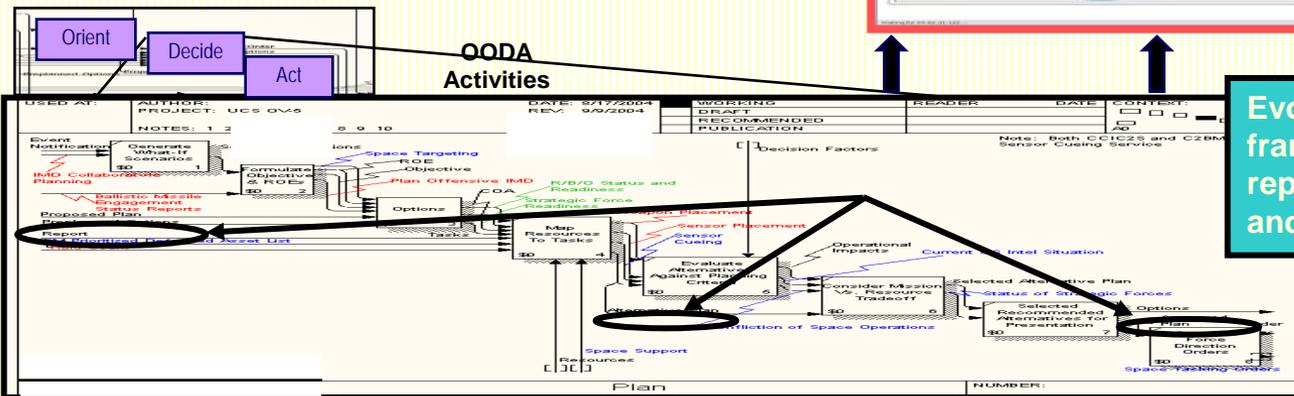
Demand on the Grid

- As consumers put more demands on the antiquated system, the more degraded the network becomes; thus, becoming more susceptible to intrusion.
- Today, we perform “band aide” analysis with technology as the primary prescription. We minimize the “human input” into the overall equation.
- Since consumers are a major part in reducing demands on the system,
 - Changes in consumers behaviors would provide a window whereby the nation could move more rapidly towards building a robust and adaptive power infrastructure, and
 - Reduce the factor of self-denial - “it is not my problem.”

Human Interoperability Information Flow and Sharing

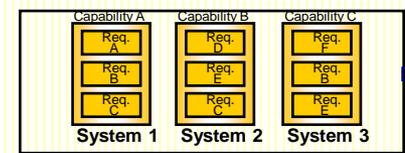


Operational Views

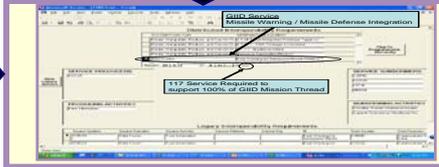


Evolving Capability within the framework that provides a visual representation of required activities and information.

GAPS in Capability

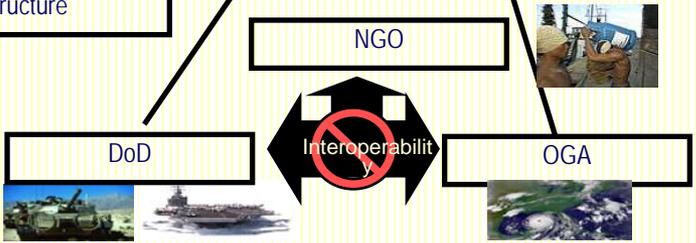


System Contribution, Supporting Systems Infrastructure



Common Language Discovery
De-confliction of language inhibitors

Policy & Governance



Outputs
Performance Requirements Integration
Requirements Functional Requirements
Associated Architectural Products

IN SUMMARY

- While we work towards transforming the electrical transmission, distribution, metering, and so forth, we must also look to transforming the way we think about our behavior and the affects on the system.
- The expectations that technology will minimize or reduce energy consumption; save lives military lives, limits our scope of understanding of how to address operational energy, conservation of energy, renewable energy and more.
 - Need to adapt a comprehensive approach to adequately merge technology and human factors to provide positive and sustainable changes in human behavior towards energy.

IN SUMMARY

(continued)

- Require an infrastructure that can execute a multifaceted set of process strategies that will address all elements of communication exchanges.
- Require innovative capabilities that can recognize, learn, adapt, and defend against human behavior anomalies.

POC Information

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