Masters Forum 20

Passing the Torch

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Knowledge Management (KM) approach

- In the past …
  - KM focused on gathering lessons & documenting
  - Passive knowledge capture

- New emphasis …
  - KM focus on doing something before lessons shelved or people move on
  - More active … knowledge implementation (infusion)
The Ares project implemented a new KM approach making Lessons Learned (LL) actionable by creating a systemic method to infuse captured knowledge into working documentation.

3 Methods for Data (Knowledge Object (KO)) Capture were used:
- **Workshops** – group activities using ThinkTank tool, 38 conducted resulting in 1732 KO’s
- **KID form** – web based individual input, 65 submitted resulting in 56 KO’s
- **Harvesting** – gathering data from LL Reports, 8 harvested resulting in 138 KO’s

**Data Integration/Distilling**
- KO’s were sorted, combined, and dispositioned via the Distilling Team – a forum consisting of engineering, S&MA, and project representatives, chaired by Chief Engineer
- The Distilling Team met 2/week from 11/10 - 3/11; currently being performed virtually
- To date, 1392 KO’s (LL’d) have been distilled into 72 Knowledge Items (KI’s); KI’s may include multiple KO’s; KI’s document actions required for resolution
- Distilling assigns actions to MSFC discipline leads for implementation

**Ares Project Lessons Learned Report is being generated; due date May 27, 2011**

**Ares KM approach is being considered for Center adoption**
Many knowledge items (lessons) trace back to the following “Key Themes”:

1. Experience

- Coupled with or amplified by limited resources
- Most of our experience comes from operational systems or concept development & analysis ... few of us have done cradle-to-grave (especially larger systems)
- Learning curves cost money
  - Get the most experienced people in development and design integration into leadership roles,
  - Or develop a plan to get leaders the experience needed or a mentor to help them
- Do not get caught by, “we won’t make the same mistake” ... Make good use of the last guy/gal that bumped their heads on an issue – they are highly motivated to improve
2. Emphasize the end product

- Arguably, one of our toughest challenges & hard wired to our experience
- Balance tipped toward process focus, away from end product
  - Or “hammers looking for nails to drive”
  - Symptoms:
    - Bureaucracy … not sure why, but “we have got to do all of these things” or “it’s always been done that way”
    - Adding to the process … never quite ready or robust enough … never enough requirements, plans, etc.
    - Not sure of when … everyone needs done now… not every requirement, process, plan, or function needs to be done up front
- Rebalance … more toward end product
  - Work back from the end game – what is needed?
  - Understand what absolutely needs done and the impact to the end product … know what you need & what you deliver
  - Know when is the appropriate time
  - Value added … MUST be able to defend each step, task, function, process
“Key Themes” from Ares

3. Planning
   - Emphasis on detailed planning up front to avoid “ready, fire, aim”
   - Argue requirements & rules of engagement very early in the process

4. Leadership
   - Develop clear, concise, well communicated definitions of responsibility & authority
   - Need “benevolent dictator” – groups recommend & then the leader listens & decides … cannot always have consensus
“Key Themes” from Ares

5. Communication

• Clearly denoted & easily accessed authoritative data.
• Get the word out. Lot’s of informal conversations are good, but must re-double effort on getting decisional data to decision-makers and decisions/direction back to the implementers
• Continually remind people of the org structure, who owns what, & who has authority to decide … should be the intro on every management briefing

6. Discipline

• Once agreed to, we must follow the rules, requirements, & guidance
• Work issues / decisions at the appropriate level … tie issue or decision to a singular person with responsibility & commensurate authority at lowest level that can handle the issue / decision
• Efficient decision-making … focus on getting to decisional “nugget” and getting that to the agreed-to authority … no arguing back-and-forth (interfaces, across centers)
“Key Themes” from Ares

7. CM & DM

- The impact of establishing strong Data & Configuration Management was underestimated early in the program.
- Recommend standing up CM & DM as center-level functions (in work) & negotiate appropriate support across projects/programs

8. Design & analysis integration

- Design & analysis cycles were not integrated between project & element levels
  - Disconnects were evident between elements & between projects
- Design & analysis did not link at times
  - Need the “on-design” analysis for configuration in design reviews (PDR & subs)
- Recommend walk-thru planning of design cycles & analysis cycles
  - Number & type of cycles
  - Design & analysis team clearly define how they will work together
  - Plan in appropriate hard linkages between the current design input into the analysis cycle, with design reviews & long-lead efforts in mind
  - Supported by projects & elements
Next Steps

♦ Near term … Ares to SLS transition
  • Ares will have to “hand off” soon
    – Get info to appropriate actionee (authority / leader)
    – Document KI’s (lessons) & recommended actions
  • CE office focus
    – Completing “distilling” and disposition of lessons (aka KI’s) and actions
    – Increase emphasis on getting info to actionees & help work agreed-to actions with:
      • Go-do’s … engineering disciplines (branch/division level)
      • Tactical decisions … new SLS Program
      • Strategic decisions … MSFC leadership & CE Office … policy, procedures, etc.

♦ Mid-term … Decide on continuous process for MSFC
  • Kaizen event held February 22-24 for the Ares Project & MSFC Office of Chief Engineer
  • Recommended MSFC develop & maintain a simplified continuous Knowledge Implementation Process, potentially lead out of CE Office
  • Next evolutionary step for existing Lessons Learned Information System (LLIS)