ITS CABINET WORKING GROUP MEETING
TUESDAY-THURSDAY, 07/28/09-07/30/09, SALT LAKE CITY, UTAH

ATTENDEES
- Ron Johnson, Harris County, TX *
- Bob Rausch, TransCore *
- Ralph Boaz, Pillar Consulting *
- Jim Rose, Econolite *
- David Wells, Caltrans *
- Mohamed Talas, NYCDOT *
- Peter Skweres, MN/DOT *
- Tim Fiebrich, Siemens *
- Reza Roozitalab, McCain *
- Scott Evans, EDI * (via conference call Tuesday)
- Craig Gardner, Itelight * (Wednesday)
- James Kinnard, Adaptive Solutions
- Bruce Eisenhart, ConSysTec
- Leah Fuss, Econolite
- Dmitri Khijmiak, Kapsch TrafficCom (Tuesday)
- Sean Coughlin, Caltrans District 4
- Dave Miller, Siemens
- Siva Narla, ITE
- Steve Alonge, Noblis
- Jean Johnson, NEMA (via conference call Tuesday, Wednesday)
- Kent Kacir, Kimley-Horn (via conference call Tuesday)

MISSING WG MEMBERS
- Chuck Morrison, Seattle DOT *
- Kenneth Lee Montgomery, GADOT *
- Raul De Anda, LADOT *
- Robert Welborn, City of Houston *
- Dave Holstein, Ohio, DOT *
- Peter Ragsdale, Consultant *

[* indicates a voting member of the Working Group.]
[Action items are assigned using capitalized last names in brackets.]

GENERAL
- Introductions
- Meeting Conduct Guidance
- ITS Cabinet Working Group Membership
- Additions/Modifications to the Agenda
  - Will have presentation and discussion on UL adherence. Peter Skweres to provide presentation.
- ITS Cabinet V2 Project Status
  - Approximately 6 months behind schedule.
  - Quick Response Group had numerous calls and hashing out thoughts to come up with current user needs coming into this meeting.
  - Quick Response Group members: Bob Rausch, Ron Johnson, Craig Gardner, David Wells, Scott Evans, Reza Roozitalab, Tim Fiebrich

CONOPS REVIEW
- Ralph Boaz presented definition of a well-written user need:
  1) Uniquely Identifiable: Each need must be uniquely identified (i.e., each need shall be assigned a unique number and title).
2) Major Desired Capability (MDC): Each need shall express a major desired capability in the system, regardless of whether the capability exists in the current system or situation or is a gap.

3) Solution Free: Each need shall be solution free, thus giving designers flexibility and latitude to produce the best feasible solution.

4) Capture Rationale: Each need shall capture the rationale or intent as to why the capability is needed in the system.

   • Sean Coughlin asked if the reference to the B-List should be included in the standard. Group felt that it shouldn't be.

   • Section 4 review.
      - Working Group agreed to the three application areas of Traffic Management, Ramp Metering, and Data Collection.
      - “Field Master” to be changed to “Field Management Station”.
      - IMSA certification is not required by all agencies.
      - Ralph noted that motoring public are not considered users but beneficiaries of the system
      - Under law enforcement: intersection -> TFCS, signals -> field outputs

   • Section 5 review.
      - Discussed that accessible ped functions are included in “Field Inputs”
      - Discussed that calling out the ATC in the ConOps is not specifically a need but only the interfaces. ATC to be called out in the requirements.
      - Field Outputs: change “lighting” to -> “display”
      - Discussions re: cabinet monitoring language and current monitoring (or external device monitoring)
      - Discussed addition of accessible ped signal/button to Figure 4 diagram but this was not included.
      - TM Displays -> Field Displays
      - Discussed that power terms to be included in the ConOps are "service," "raw," and "clean." Where "service" refers to power that comes externally, "raw" refers to power that is surge protected but not filtered, and "clean" refers to power that is both filtered and surge protected.
      - Update Figure 2 picture to provide a distinction host-field and peer-to-peer (external) communications
      - Update Figure 3 diagram: “Field Output Voltages” to “Field Output Measurements”

   • Section 6 review.
      - Group decided that they would prefer that the rationale be in italics and to keep the user need in the standard font.
      - Steve Alonge recommended rewording of user needs as follows: "The user needs the TFCS to..."  WG agreed to change.
      - 6.1.1: discussion of Datakey and OS-9 as possible exceptions to open/non-proprietary need (does open architecture necessitate non-proprietary). WG decided to leave in the need for open architecture.
      - 6.1.4: discussion of reliability and appropriate requirements (MTBF?). WG decided that this was not practical.
      - 6.1.6: need to elaborate on quality rationale.
      - Change references of USA to North America in most cases.
      - Need to Reconcile 6.1.11 and 6.7.3 (cabinet configuration/Datakey)
      - Removed 6.1.14 for electrical technician (not currently obtainable).
      - Consider adding PF of 0.9 or higher (where appropriate) to 6.1.15?
      - 6.1.17: constraint or need? Define specific subassemblies/modules eligible for interchange?
      - Language changed to facilitate use of v2 components in v1 cabinets.
      - Discussed testing as monitoring-testing-reporting
      - Change loop detectors to inductive loops (throughout)
      - Discussed including TS2-BIU into v2 (NOT currently considering)
      - Use “commonly-deployed” rather than “legacy” (throughout) [not done completely yet]
      - WG formally accepted the application areas and users as presented in the current ConOps.
      - Need to treat internal communication loss as separate failure
      - Discussed specific CM malfunctions and field display confirmation
        • Need description of malfunction response (configurable)
DRAFT NOTES

- Should change malfunction to “benign”, “fallback” (or some other term to indicate malfunction state)

- NOTE: Not all changes are captured in these notes. Many changes were made to the ConOps in real-time.

UL PRESENTATION / DISCUSSION

- Peter Skweres gave presentation on UL and Mn/DOT’s perspective.
- Reza Roozitalab noted that technically, there was no UL standard that covered transportation cabinets.
- NEMA TS1/TS2 and UL508 are INCOMPATIBLE in some areas
- Decided to form a subgroup to study the issue. Ron Johnson, Peter Skweres, Reza Roozitalab, and Jim Rose to work on it.
- Key discussion point was that requirements of US508 could be added to standard without the need/requirement for actually requiring the testing by a lab.

CONOPS REVIEW (cont.)

- The WG formally agreed to the following:
  1) It is understood that the direction from the USDOT is that this is a progression of the previous standard.
  2) Version 2 of the standard would not have a radical difference to the rest of the standard to do the small cabinet. This means that what ever architectures are chosen (whether existing or new) for Version 2, they will apply to all of the cabinet enclosures.
- Modify 6.4.4: “fault tolerance.” Bob provided an update that was revised by the group.
- Discussed that in the standard, we will need to have
  6.6.2/6.6.3: need both clean and raw power
  Revisions to 6.6: to accommodate other service power sources
  6.6.5: backup power “provided” vs. “supported” — change to Backup Power Interface (?)
  6.7: use consistent language with status/monitoring section
  Removed 6.9.2 communications mounting with the intent captured in ease of maintenance (like connection panels) and under external communications.
  Discussion of internal/external communications requirements
  Add note that all comm. protocols are to be non-proprietary and standardized
  Added needs to identify higher-density input and output subsystems
  Discussed a need for inventory management and bar-coding of components. This did not seem to gain any traction.
  Discussed collapsing expandability with scalability. Note that previous discussion had combined them. WG decided to separate them again with the understanding that expandability has to do with adding more devices to the cabinet and scalability has to do with the size of the cabinet.
- Discussed "extensibility."
  - Ralph gave definition from Wikipedia…
    In systems architecture, extensibility means the system is designed to include hooks and mechanisms for expanding/enhancing the system with new capabilities without having to make major changes to the system infrastructure. A good architecture provides the design principles to ensure this—a roadmap for that portion of the road yet to be built. Note that this usually means that capabilities and mechanisms must be built into the final delivery which will not be used in that delivery and, indeed, may never be used. These excess capabilities are not frills, but are necessary for maintainability and for avoiding early obsolescence.
  - It was decided to add a general need for extensibility. Previously, there was a need for this but only in reference to the communications.
- Steve Alonge noted lack of operational scenarios.
  - Ralph shared definition of Operational Scenarios from definition in ANSI standard.
    o Operational scenarios describe how the system will be operated under various conditions. For example, incident management scenarios will include normal monitoring, the sequence of events following an incident, and the response to failure [e.g. sensors or communications]. These scenarios will describe the activities from the viewpoint of each of the participants.
Some techniques for describing the scenarios are flow diagrams and use cases, which are part of the unified modeling language used for software development.
- WG was undecided whether operational scenarios were necessary or appropriate in this case.
- Ron Johnson agreed to generate a draft scenario for the group to look at. Suitability to be discussed later. [JOHNSON]

- Reviewed B-List items. Group felt that they were all covered in our user needs but should be revisited during the requirements phase.
- Group felt that the virtual screen concept was inferior to a useful display on as part of the system monitoring function or separate diagnostic device.
- Group felt that available memory key space for application purposes was covered by "extensibility" discussions.

REQUIREMENTS GENERATION
- Ralph provided a definition of a well-formed requirement. A well-formed requirement will generally take the form: [Actor] [Action] [Target] [Constraint] [Localization].
  o The localization and constraint portions are important, but not all requirements will have both.
  o The constraint identifies how you will measure success or failure of the requirement.
  o The localization identifies the circumstances under which the requirement applies.
  For example: The System [Actor] shall generate [Action] event reports [Target] containing the following information [Constraint] on a scheduled interval [localization]. If a requirement can't be stated in this simple format, you probably need to define the functionality using multiple requirements.
- Discussed that the requirements could be organized by application area. The WG decided that we would continue in the current organization and that the "localization" portion of the requirements could be used if necessary to identify specific application areas, size of cabinets, etc.
- Drafted some requirements for small-sized cabinet.
- Consider looking at the naming convention for housings. WG did not like the term CBD for small cabinet as it could be used in a number of applications.
- Jim Rose to provide input from the NEMA TS7 work.

ACTION ITEMS
- Jim Rose to provide TS7 input from NEMA. [ROSE]
- Consultant team to provide cleaned-up ConOps by 8/10. [CONSULTANT TEAM]
- UL508 team provisions to come up with recommendation by 8/17. [UL508 SUBGROUP]
- Ron Johnson to prepare draft operational scenario(s) for discussion purposes. [JOHNSON]
- Consulting team to have updated schedule by 8/10. [CONSULTANT TEAM]

NEXT MEETINGS
- TBD