

National Spherical Torus eXperiment Upgrade

Working During The COVID Pandemic

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Design Reviews Pre COVID

- Reviews prior to COVID were already a hybrid of in person & zoom
 - This had worked well with very minimal impact to the reviews due to
 - Stable internet connection
 - IT personnel on hand to address connection issues - both onsite and offsite
 - Spare equipment on hand to replace failed units
 - Minimum number of simultaneous meetings held required less coordination of conference rooms and Zoom links
 - Onsite reviewers could see & touch equipment/systems
 - Tours of areas and equipment prior to talk
 - Actual equipment or 3D printed prototypes at the review

Design Reviews Since COVID

- Reviews since the start of the pandemic have been 100% virtual via ZOOM.
 - Everyone working from home with their own equipment & internet providers led to many challenges
 - Loss of connection problems
 - Equipment issues
 - New equipment purchased and sent to employees homes elevated most of these issues
 - Presenters not always aware there was a problem
 - Zoom fatigue became an issue
 - When to take breaks became harder to judge
 - Scheduling became much more difficult
 - Reviewers in different time zones
 - Setup of Multiple simultaneously meetings
 - This shortened the time frame of the reviews, but increased the complexity of keeping the review on schedule
 - Had to set up private zoom rooms for committee members to have private conversations
 - Presentations had to depend more on pictures to ensure reviewers had a clear picture of what was being reviewed

Project and Facility Meetings

- Recovery project pre and post shift briefs are held on ZOOM.
 - Started as a hybrid of in person (conference room) and zoom.
 - Social distancing requirements made communication difficult.
 - Moved to 100% zoom due to building occupancy limits and social distancing requirements.
 - This greatly improved communications
 - This has worked well with no impact to the brief.
- Daily D-Site Plan of the day coordination meeting is held via zoom.
 - This meeting is held to coordinate all activities at D-Site.
 - This meeting was a hybrid of onsite and zoom prior to COVID restrictions.
 - Moving to a full zoom meeting has actually improved the quality of the meeting.
 - Follow on conversations however have been much more difficult.

Completing Onsite Work Much More Difficult

- Reduced site personnel limits, greatly increased scheduling difficulties
 - Some jobs had to be postponed.
 - Some jobs started and stopped a number of times to allow others to continue with more personnel.
 - Some departments had to rotate on-site personnel.
- Due to the inability to perform some jobs socially distanced, if one crew member tested positive for COVID , the entire crew was quarantine for two weeks.
 - This resulted in significant delays.
- Pre-Job briefs started out as full zoom
 - Technicians onsite (but not at job location), all others on zoom due to site personnel limits.
 - Missteps underscored the need for all personnel involved to be onsite at the job location.

Completing Onsite Work

- Pre-Job Briefs move to a hybrid of limited on site and Zoom
 - Technicians, System COG, and Field Engineer on site at job location (on zoom), all others on zoom.
 - Bull horn used to overcome hearing issues caused by social distancing requirements.
 - Social distancing requirements still had an impact on feedback conversations.
 - Pre-jobs took significantly more time to perform.
 - Wi-Fi cameras set up at job location so Cog could monitor work.
 - Improvement over full zoom but still had issues.
- Pre-Job Briefs are now fully on site, with limited Zoom as needed
 - Technicians, System COG, Safety personnel, are onsite at the job location.
 - Use of N95 respirators has allowed personnel to work together without the 6 foot social distancing requirement.
 - This has improved communications for both the pre-job brief and work in the field.
 - Has removed the requirement to quarantine the entire crew if one member tests positive for COVID
 - A number of Tablets were purchased
 - Tablets used during pre-job to show zoom personnel critical items.
 - Technicians also use the tablets to talk to the COGs via zoom from the field as issues come up.
 - When necessary RE's, SME's, work control personnel, and management personnel can attend via zoom - this is now becoming less frequent as our site personnel limits have been lifted.

On-Site Construction COVID Considerations

- Pre-start
 - Communication of PPE & precautions
 - Additional and more complex training (remote delivery), COVID testing
 - Alignment of contractor expectations and laboratory requirements
- Worker Coordination
 - Oversight/ensurance of PPE compliance & testing
 - Consider alternate schedules (swing shifts) to minimize density
- Coordination with off site staff
 - As-found conditions, redlines, as-builts all required digitization & flexibility in communicating to offsite personnel

QUESTIONS?