

**NREL / DOE SUBCONTRACT
DEVELOPMENT OF A UL
STANDARD FOR THE
INTERCONNECTION OF
DISTRIBUTED GENERATION,
QUARTERLY REVIEW MEETING
July 25, 2001**

Presented by:
Gordon Gillerman
Manager Governmental Services



Project Update

- Progress on the research, planning, development and the expansion of the Standard For Inverters, Converters and Controllers For Use In Independent Power Systems, UL1741.



Project Goal

- Under this contract, we are combining the appropriate safety requirements, polished by the knowledge we have attained in performing these evaluations, and in consultation with industry experts through the STP process along with the necessary utility interconnection requirements from IEEE 1547. The fruits of this labor should address the needs of Electrical AHJ's and also many Utility Interconnection Engineers.



Project Lead Engineer

- Tim Zgonena - UL Sr. Project Engineer, Primary Designated Engineer for UL1741.
- Tim is unable to attend this meeting as he and his wife, Kim are awaiting the delivery their second child. The baby is due on August 8, 2001 and their previous son arrived three weeks early. Kim would not understand Tim's absence from this 9 month previously scheduled delivery.



Additional Engineering Staff

- **NREL Technical Monitor**
 - Ben Kroposki - P.E. Sr. Engineer
- **UL**
 - Robert Pence, P.E. Associate Manager
 - Susan Malohn, Project Engineer
 - David Dini, Sr. Research Engineer
- **Sub Contractors**
 - Kent Whitfield, Spire Solar Chicago
 - Chuck Whittaker, Endecon Engineering



Addition of separate sections for the source specific issues to be addressed under the construction and testing of the different DG product types.

- Photovoltaic Modules and Panels
- Micro-turbines
- Wind and Hydro Turbines
- Engine Gen Set Interconnect Controllers
- Fuel Cells



Ongoing Harmonization of UL1741 with IEEE P1547

- We are working with the most recent P1547 Draft.
- We are prepared to incorporate the changes in the next draft of IEEE P1547.
- Eagerly awaiting the next draft of IEEE P1547.



IEEE P1547 Items Being Added to UL1741

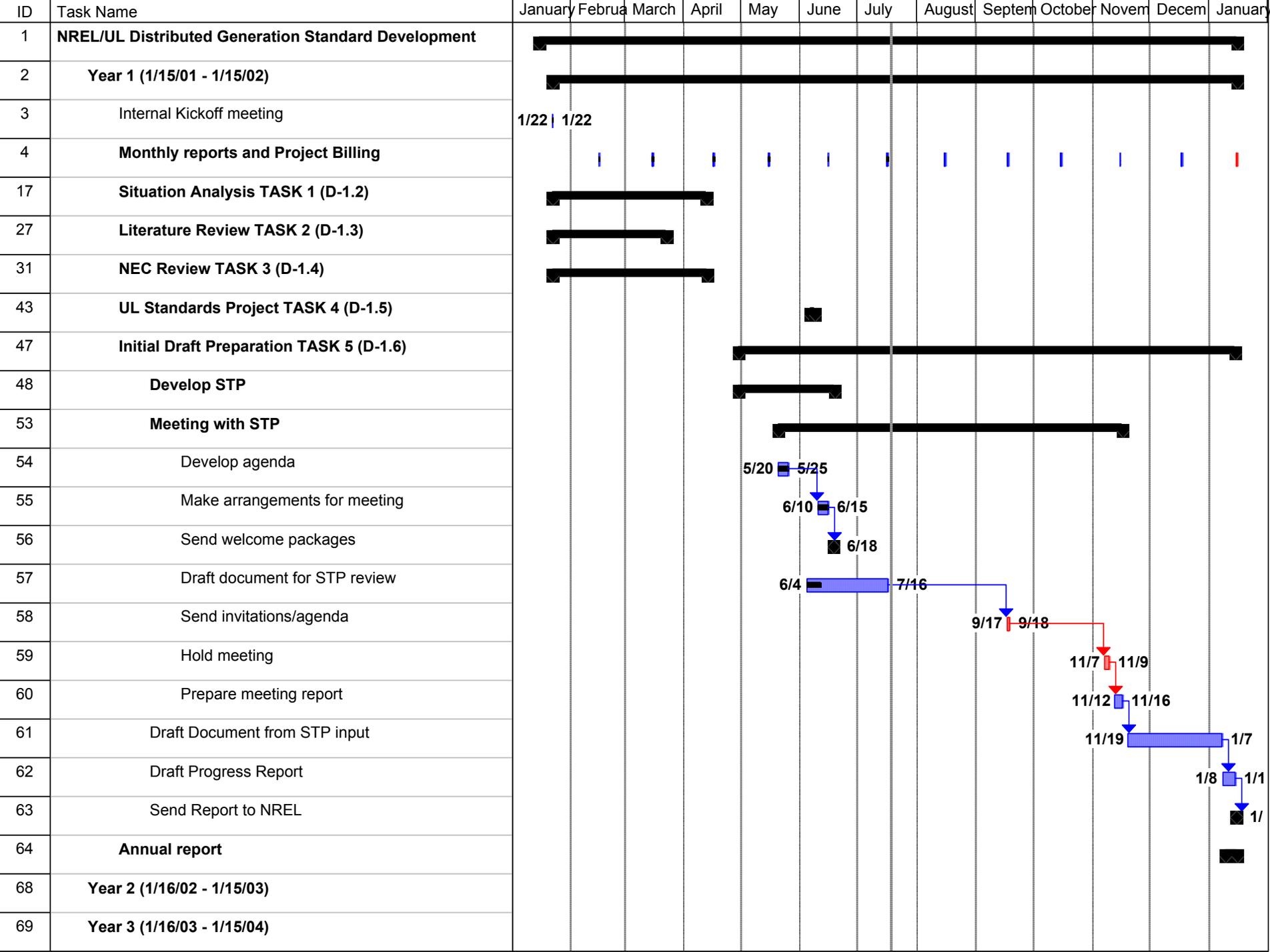
- Controllers for rotating generators
- Source Requirements for other DG types
- Procedures for new IEEE P1547 requirements
 - Surge withstand
 - Synchronization / loss of
 - Immunity protection
 - Flicker
 - Field verification test capability



Potential Problems

- We have little control over the status and acceptance of the IEEE P1547 document which is crucial to the development and expansion of the UL1741 document. This is more of an issue for the work under option years 1 and 2 of this project.





Base Year / 2001 Tasks Completed or in Process

- Perform Literature Review
 - Establish the STP group
 - Situation Analysis
 - NEC and other Interconnect Document Review and Report
 - Open UL Standards Project
 - Rough Draft and STP Meeting
- Completed
 - Completed
 - Completed
 - Completed
 - Completed
 - In process



Base Year / 2001 Tasks To Be Completed and Due Dates

- 9/28 • Create and Review Rough Draft
- 10/9 • Mail Agenda with Rough Draft
- 11/7-11/9 • STP Meeting
- 12/11 • Send meeting report to subscribers and STP members
- 1/15/02 • Progress Report on STP / Draft
- 1/15/02 • Annual Report



Testing Research

- Large simulated utility testing and design
- Collaboration with Sandia Labs on the Harmonic Distortion testing with both simulated and actual utility grids
- Application of the Anti-Islanding Test to larger three phase products
- DG Test equipment identification and acquisition



Standards Technical Panel (STP)

- The STP Process incorporates American National Standards Institute (ANSI) approval with the development of the Standard and reduces the time delays associated with UL starting the ANSI approval process for the Standard after it has been developed.



We Have Formed the UL 1741 Standards Technical Panel (STP)

- We have assembled an impressive STP, comprised of various manufacturers of different types of DG products, utility interconnection engineers from various utilities, several DG industry experts and independent contractors in addition to representation from NREL and UL.



Summary

- The draft construction is under way.
- We are on track with the work under this project and meet the requirements under the subcontract.



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