



DOE Distributed Power & Industrial DG Quarterly Review Meeting



July 26, 2001

Increasing the Use of DG in the Semiconductor Industry

Subcontract # 400006029

Barry Cummings, SRP





Responsible persons

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- ◆ **Project Manager,**
Barry Cummings
SRP Phoenix Arizona
 - ◆ **Technical Project Manager,**
Tom Rizy,
Oak Ridge National Lab

Description

- ◆ Increase number of distributed generation systems by using multi-purpose projects benefiting:
 - power provider
 - semiconductor industry



Hypothesis

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- ◆ **Combining supplier and semiconductor FAB plant benefits significantly increases opportunities for D.G.**
 - ◆ **Technical and economic changes in the next 5 to 10 years may provide new opportunities for D.G.**

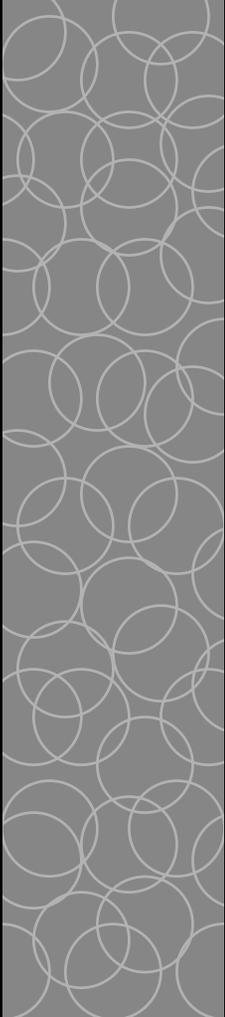


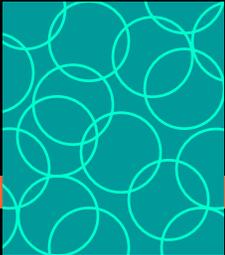
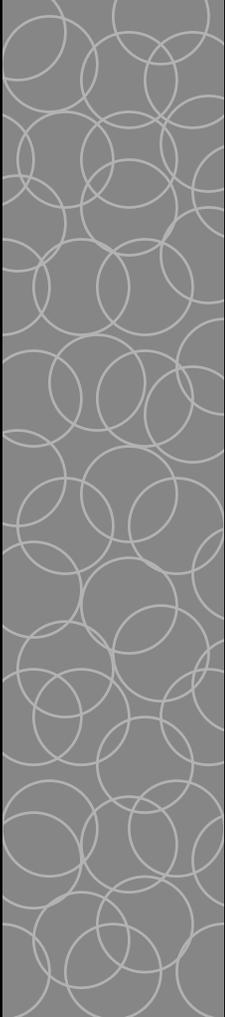
Objectives

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- ◆ **Create a management decision guideline**
 - ◆ **Provide research for site-specific, feasibility studies**
 - ◆ **Identify technical and economic improvements needed**
 - ◆ **Estimate USA market**
 - ◆ **Calculate total effects of increase
Number of DG in Semi plants**

Alternatives within contract scope

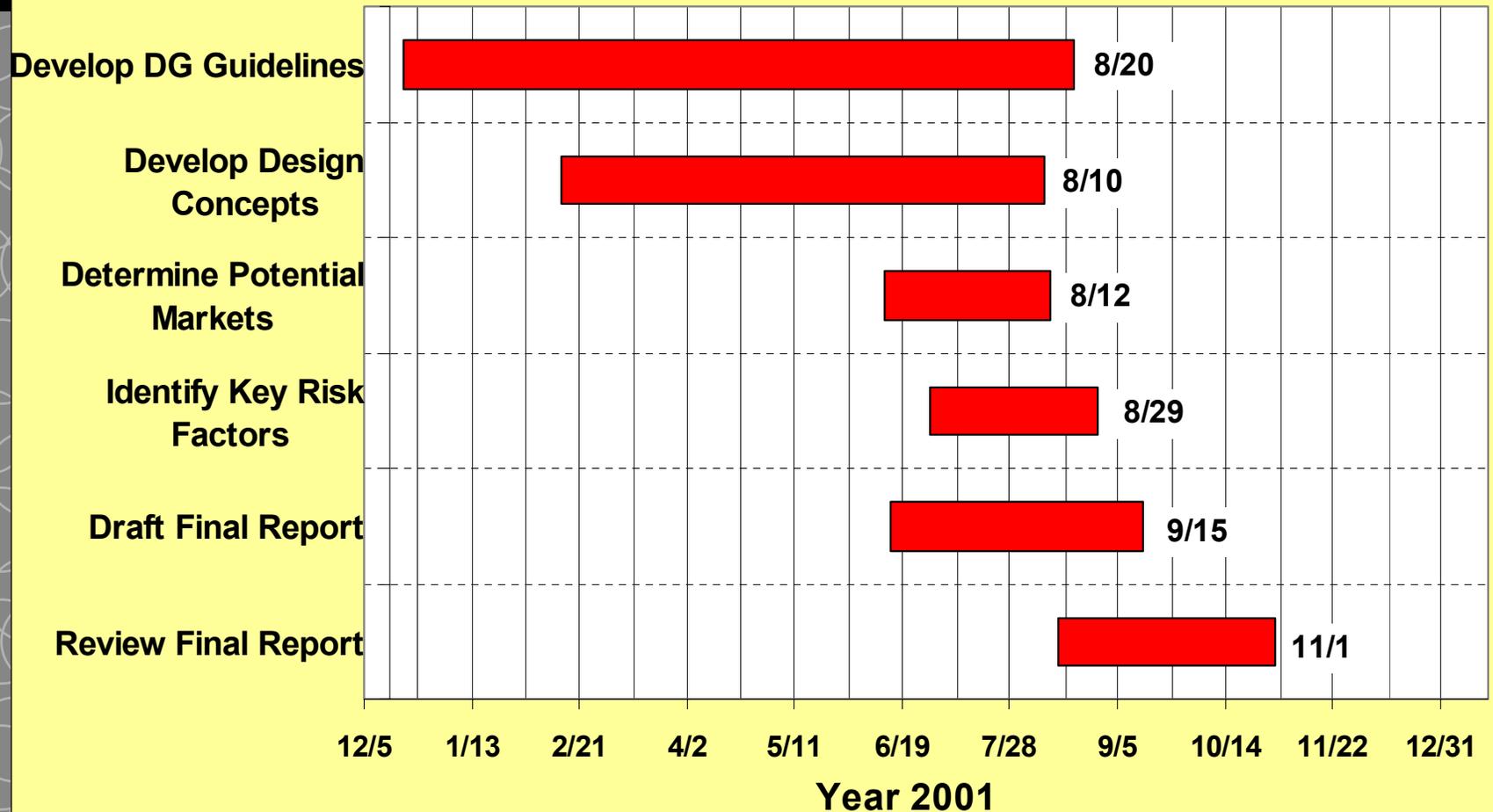
- ◆ Gas Turbines
- ◆ Fuel Cells
- ◆ Alternative sources assumed to require energy storage

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- ◆ **DOE funded through Oak Ridge National Laboratory**
 - ◆ **Salt River Project, a non-profit, electric & water storage & deliver utility serving 747,000 electric customers, central Arizona**
 - ◆ **Intel**
 - ◆ **SEMATECH**

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- # **Black & Veach** (Subcontract) – Suqing Wang, Project leader
 - # **SEMATECH** – Walter Worth, Ram Mallela
 - # Volunteer work group includes:
 - Intel** – Phil Sarikas, Michael Bick
 - Motorola** - Phil Naughton
 - AMD** - Dan Smith
 - Portland Gas and Electric** - Doug Findlay

Gant chart

Gant Chart



1. Application of DG to Semiconductor Industry

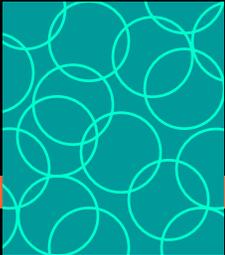
- ◆ Environmental, Legal, and Institutional Issues
- ◆ Review of Distributed Generation Technologies
- ◆ Matrix of DG Requirements and DG Technologies
- ◆ Application Guidelines

2. Develop Design Concepts

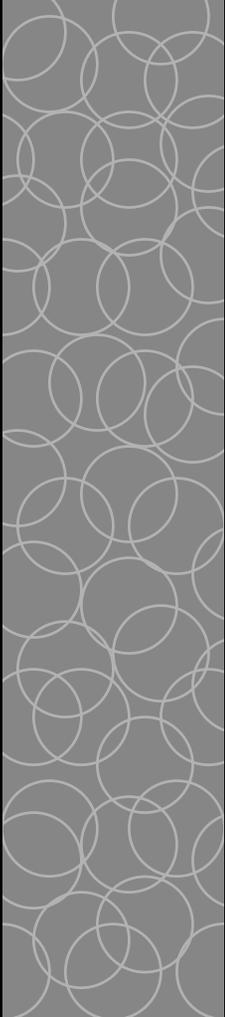
- Size major equipment
- Heat balances flow diagrams
- General Arrangement drawings
- Single line electric diagrams
- Economic analysis including operating costs

3. Determine Potential Markets

- Survey and forecast Potential Semi Market for Distributed Generation
- Macro Effects of USA Market Penetration



4. Identify Key Risk Factors

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- **Identify and evaluate key risk factors**
 - **Recommend R&D to reduce risk and increase acceptance of distributed generation**



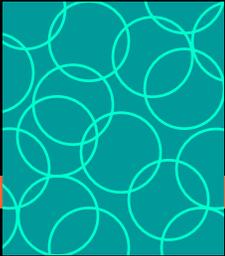
Sub tasks status

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- ◆ **Work plan complete**
 - ◆ **Requirements draft complete**
 - ◆ **Draft air quality, water quality, & other external requirements**
 - ◆ **Gas Turbine characteristics researched**

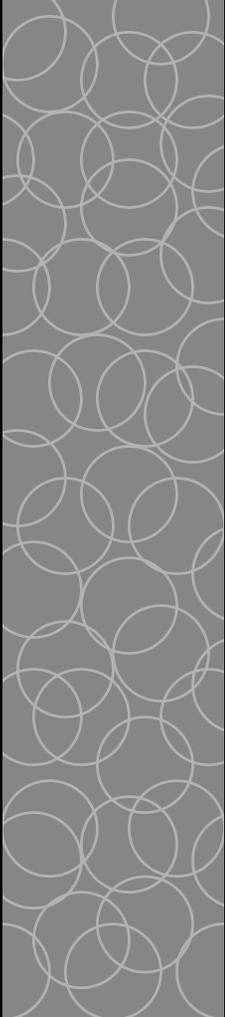


Sub tasks status (cont.)

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- ◆ **Gas turbine design cases report complete from Black & Veach**
 - ◆ **Ancillary services ‘white paper’ drafted**
 - ◆ **Economic model (ms-excel) complete**
 - ◆ **System response dynamic modeling base cases complete**



Sub tasks status (cont.)

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- ◆ **‘White paper’ discussion on selecting alternative generation considered in scope**
 - ◆ **Rate analysis base complete**
 - ◆ **Purchased World Fab Watch July 2001 issue from Strategic Marketing Associates**
 - ◆ **Final report outline complete**



Summary

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- ◆ **Project interest high – presentations to:**
 - **SEMATECH**
 - **ASU CREATE Clean Room Forum**
 - **ASU's AIM sponsored seminar "Arizona and the Energy Crisis"**