DESIGN REVIEW DEFINITION

A DESIGN REVIEW IS AN ELEMENT OF AN ORDERLY ENGINEERING PROCESS IN WHICH AN EVOLVING DESIGN IS REVIEWED AT CRITICAL STAGES OF THE DESIGN PROCESS BY PEOPLE WITH RELEVANT EXPERIENCE, SUCH REVIEWS HELP THE RESPONSIBLE ENGINEER FOLLOW ESTABLISHED PRACTICES TO REDUCE THE NUMBER OF PROBLEMS ENCOUNTERED IN THE DESIGN AND IMPROVE THE PRODUCT RELEASED TO MANUFACTURING.
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RELEVANT EXPERIENCED PEOPLE HELP AN ENGINEER FOLLOW ESTABLISHED PRACTISES TO REDUCE PROBLEMS

IMPROVED PRODUCT IS RELEASED TO MANUFACTURING
WHAT IS A GOOD DESIGN?

MEETS SYSTEM SPECS WITHOUT OVERDESIGN

PRODUCIBLE IN THE FACTORY - ADEQUATE MARGIN TO ACCOMMODATE PRODUCT VARIABILITY

MAINTAINABLE IN THE FIELD

EASY TO TEST, FAULT ISOLATE, AND REPAIR

DESIGN CAN ACCOMMODATE CHANGES OR MODULAR UPGRADES

REALIZES LOW LIFE CYCLE AND UNIT COST
CONDUCTING DESIGN REVIEWS
REVIEW CONTENT

GUIDELINES AND CHECKLISTS

GIVE ALL DATA NECESSARY TO SUPPORT THE DESIGN AND DESIGN DECISIONS

FORMAT IS NOT NEARLY AS IMPORTANT AS CONTENT

INCLUDE:
- SUMMARY OF TRADE STUDIES AND ALTERNATIVES CONSIDERED
- FAILURE ANALYSIS OF DEVELOPMENTAL TEST FAILURES
- CONFORMITY WITH SPEC REQUIREMENTS OR REQUESTED DEVIATIONS
- COMPLETE ENGINEERING DESIGN PACKAGE WHERE APPROPRIATE
  - DRAWINGS
  - SPECIFICATIONS
  - ACCEPTANCE TEST REQUIREMENTS
  - TOOLING DRAWINGS OR SOFTWARE LISTS
REVIEWS AND THE DESIGN PROCESS

SUMMARY

REVIEWS SHOULD BE AN INHERENT ELEMENT OF THE DESIGN PROCESS

ATTENDEES SHOULD BE THOSE WHO CAN CONTRIBUTE BY REASON OF

- EXPERTISE

- PREVIOUS EXPERIENCE

- VARIED POINTS OF VIEW

THE OBJECTIVE OF EACH REVIEW IS TO INSURE THAT CONSIDERATION IS GIVEN TO ALL PERTINENT ISSUES RELATED TO A DESIGN DECISION BEFORE PROCEEDING WITH THE NEXT PHASE
EXPECTATIONS AND REALITY
WHAT DESIGN REVIEWS ARE NOT

DESIGN REVIEWS ARE NOT:

- A DOG AND PONY SHOW FOR THE BOSS
- A MODERN DAY VERSION OF THE SPANISH INQUISITION
- A FORUM FOR MANAGERS, STAFF ENGINEERS AND OTHER EXPERTS TO DISPLAY THEIR BRILLIANCE
- A SENSITIVITY TRAINING SEMINAR FOR THE REA
- A SEARCH FOR A NEW AND DIFFERENT WAY OF ACCOMPLISHING THE DESIGN OBJECTIVES
- A FORUM CONVENED TO WITNESS PLACING THE RUBBER STAMP OF APPROVAL ON THE DESIGN
CONDUCTING DESIGN REVIEWS
MANAGEMENT'S EXPECTATIONS

THE DESIGN BENEFITS FROM THE CORPORATE EXPERIENCE

ALL DIRECT AND SUPPORTING ORGANIZATIONS BECOME
FAMILIAR WITH THE DESIGN

GOOD DESIGN DISCIPLINE IS ADHERED TO

- USE OF DESIGN STANDARDS
- ADEQUATE MARGIN ANALYSIS AND TEST
- SELECTION OF STANDARD PARTS
- ATTENTION TO PRODUCIBILITY AND TESTABILITY
- CONSIDERATION OF COST, BOTH DEVELOPMENT
  AND LIFE CYCLE
CONDUCTING THE DESIGN REVIEW
ROLE OF THE DESIGN REVIEW COMMITTEE MEMBER

COMMIT TO TIME FOR REVIEW OF DESIGN AND DATA PACKAGE

REVIEW THE DESIGN PRESENTED
- DO NOT FEEL OBLIGATED TO INVENT A BETTER DESIGN

KEEP A POSITIVE OUTLOOK WHERE SHORTCOMINGS, PROBLEMS,
RISK AREAS ARE IDENTIFIED
- SUGGEST SIMPLE, COST EFFECTIVE SOLUTIONS WHERE POSSIBLE

FEEL FREE TO MAKE POSITIVE COMMENTS

FAIR GAME FOR CRITIQUES INCLUDE
- SHORTCOMINGS IN DATA PACKAGE, e.g.,
  INSUFFICIENT DATA, ANALYSIS ERRORS,
  INADEQUATE TOLERANCES
- POOR RATIONALE FOR SELECTING APPROACH FROM SET OF
  ALTERNATIVES
- CHARACTERISTICS OF DESIGN THAT CAUSED PROBLEMS IN OTHER
  PROGRAMS

WALK AWAY WITH A BETTER UNDERSTANDING OF THE DESIGN
WITH WHICH YOU MIGHT HAVE FURTHER CONTACT
CONDUCTING DESIGN REVIEWS
ROLE OF DESIGN ORGANIZATION

THE DESIGN ORGANIZATION PLANS FOR AND SCHEDULES REVIEWS

THE RESPONSIBLE ENGINEERING MANAGER SELECTS THE REVIEW TEAM. HE:

- INSURES THAT ALL ACTIVITIES ARE SUITABLY REPRESENTED
- VERIFIES THAT REVIEWERS ARE WILLING AND ABLE TO COMMIT THEIR TIME

THE DESIGN REVIEW CHAIRMAN SHOULD ORGANIZE THE REVIEW

- COMPLETE DATA PACKAGE MADE AVAILABLE/PRESENTED
- ADEQUATE AND APPROPRIATE TIME FOR DISCUSSION
- COLLECTION OF COMMENTS, CONCERNS AND RECOMMENDATIONS

DESIGN REVIEW INPUTS MUST BE GIVEN FAIR CONSIDERATION AND RESPONSE
CONDUCTING DESIGN REVIEWS
FOLLOW-UP

THE REA'S ROLE:

- RECORD COMMENTS AND CRITIQUES
- PROVIDE ANSWERS/RESPONSES TO DESIGN REVIEW COMMITTEE
- PROVIDE ANSWERS IN A TIMELY WAY
- LOOK FOR PRACTICAL WAYS TO INCORPORATE USEFUL RECOMMENDATIONS

THE REVIEWER'S ROLE:

- RECOGNIZE THAT YOUR RECOMMENDATIONS MAY NOT MATCH ALL PROGRAM CONSTRAINTS
- RECOGNIZE THAT NOT ALL GOOD SUGGESTIONS CAN BE ADOPTED
- AVOID "I TOLD YOU SOs," NEXT TIME YOU MAY BE THE REVIEWEE

IN THE FINAL ANALYSIS, THE RESPONSIBLE ENGINEER IS STILL RESPONSIBLE FOR THE DESIGN
DO DESIGN REVIEWS HELP?

YES IF...

THEY ARE TIMELY
THEY ADDRESS THE APPROPRIATE ISSUES
THEY ARE VIEWED WITH A CONSTRUCTIVE ATTITUDE
RECOMMENDATIONS ARE IMPLEMENTED WITH REALISTIC CHANGE CONTROLS
DO DESIGN REVIEWS HELP?

THEN...

FEWER PROBLEMS WILL BE ENCOUNTERED IN DESIGN
THE DESIGN WILL BE MORE PRODUCIBLE
ADEQUATE CONSIDERATION WILL BE GIVEN TO
DESIGN MARGIN
"ILITIES"
DESIGN TO COST, VALUE ENGINEERING, AND
LIFE CYCLE COSTS
SCHEDULE PROBLEMS WILL BE REDUCED
ALL PARTICIPATING ORGANIZATIONS WILL BE MORE
FAMILIAR WITH THE DESIGN
DESIGN REVIEW PACKAGE

REQUIREMENTS: Functional Specifications (Quantified Design Parameters)

BLOCK DIAGRAM

SCHEMATICS: Alternatives, Rationale for Selected Design (& Devices)

DESIGN CALCULATIONS (SUMMARY) and ANALYSIS

TIME LINE DIAGRAMS, TRUTH and LOGIC TABLES

SOFTWARE FLOW DIAGRAMS

TEST PLANS

TEST RESULTS, If Available

PACKAGING CONCEPTS, SKETCHES, DRAWINGS

SCHEDULE

NOTE: Design Review Package is baseling for your design. Identify any changes desired from proposal.
DESIGN REVIEW

› REQUIREMENTS

■ FUNCTIONAL

■ DESIGN SPECS-
QUANTIFIED

› OVERALL PHILOSOPHY
AND/OR APPROACH
(Why?)
GRAPHS AND TABLES

♦ TIME LINE

♦ TRUTH TABLES

♦ SOFTWARE FLOW DIAGRAMS

♦ BODE PLOTS
TESTING

WHAT -HOW- WHY?

PLANS
1. Des Notebook
   FINAL Report
2. Your Test Plans

RESULTS IF ANY

DID SYSTEM MEET SPECIFICATIONS
PREPARE HARD COPY TO TURN IN TO INSTRUCTOR ON PRESENTATION DAY - PROJECTION TRANSPARENCIES TO MAKE ORAL PRESENTATION