

General Electric Advanced Technology Manual

Chapter 1.0

Introduction

TABLE OF CONTENTS

1.0	INTRODUCTION	1.0-1
1.0.1	Course Description	1.0-1
1.0.2	Course Objectives	1.0-1
1.0.3	Use of the Manual during Course Presentation	1.0-2
1.0.4	Technical Specifications	1.0-2
1.0.5	Technical Issues	1.0-2
1.0.6	Transients	1.0-2
1.0.7	Differences	1.0-3

1.0 INTRODUCTION

1.0.1 Course Description

This 2 week classroom course provides a working knowledge of the General Electric (GE) BWR/4 design with emphasis in the following areas: systems interrelationships; analysis of integrated plant response to normal operating and transient conditions; technical issues; plant procedures and their applications; facility abnormal events; PRA insights; technical specifications including limiting conditions for operation, limiting safety system settings, safety limits, and bases; and process computer usage, application and available data. Presentations include analysis of transient curves and data from actual plant events to show integrated facility operation during normal and transient conditions. Technical specifications, plant procedures, actual plant events, and technical issues are discussed.

1.0.2 Course Objectives

The GE advanced technology course is designed to provide the student with practical exercises to reinforce the ability to recognize and analyze system responses to normal, abnormal, and emergency transients. This purpose is accomplished by providing lectures, case studies, transient responses, and technical specification examples with emphasis in the following areas:

- Technical issues
- Analyses of integrated plant responses to normal operating and transient conditions
- Facility abnormal events
- Technical specification utilization
- Probabilistic risk assessment insights
- Major differences in Boiling Water Reactors
 - reactor vessel construction
 - recirculation and recirculation flow control
 - reactor isolation and inventory control
 - emergency core cooling systems
 - rod control systems
 - containments

Students are required to prepare for the lectures by reading the appropriate course material, by participating in practical exercises, and by responding to questions during lectures.

Students will demonstrate understanding of the course material in a comprehensive final examination by:

- Analyzing conditional points on transient curves and changes in plant/system state given specific initial conditions;

- Answering objective and subjective questions concerned with industry issues and events; and
- Using technical specifications and their bases to determine the status of plant/system/component operability and required operator actions.

1.0.3 Use of the Manual during Course Presentation

Proper use of the manual during class presentations can greatly aid the student in understanding the material presented. The student should follow the presentation using the figures and diagrams provided. Properly noting minor and major points on these figures should eliminate the necessity for taking comprehensive notes during the lecture.

1.0.4 Technical Specifications

The requirement for including Technical Specifications as part of the license application is set forth in 10 CFR 50.36. The NRC-approved Technical Specifications are issued to the facility as part of the operating license. The Technical Specifications establish minimum operating limits for the facility (Section 3.0).

The format for technical specifications evolved over time. There are three technical specification formats that are currently being used. The oldest of these formats is called "custom" technical specifications because the format that was used was decided by the individual utility. In the mid seventies, the format for technical specifications was changed to a "standard" format. The third version of technical specifications is the improved Standard Technical Specifications (STS), documented in NUREG-1433, Revision 1, which was issued in April of 1995. It incorporates the cumulative changes resulting from the experience gained from license amendment applications. Many licensees have or plan to convert to these improved Standard Technical Specifications or to adopt partial improvements to existing technical specifications.

For the purpose of this course, the improved standard Technical Specifications will be used and will be provided as an open reference in both the lectures and examination.

1.0.5 Technical Issues

As operating experience was gained and tools became available to better understand potential risks, certain issues have arisen which required additional regulation and/or inspection. The technical issues provided in this manual are certainly not all inclusive, nor will all they be covered.

1.0.6 Transients

The transient curves contained in this manual were compiled and analyzed by members of the NRC's Technical Training Division and were produced from data supplied from the GE BWR/4 Simulator. Caution is advised when trying to apply these simulator curves to any operating plant. Even relatively minor changes in set points, capacities, or piping runs could

cause significant differences in indicated responses. The student should concentrate on understanding changes in various parameters caused by the initiating event, subsequent automatic operation of associated control systems and system response to the event.

1.0.7 Differences

The seven week BWR full series is based on BWR/4 design. Significant differences in earlier and subsequent designs are presented. Significant deviations from the “standard” design may be present at each individual plant. The purpose is to provide the student with an overall picture of the BWR evolution, not to infer that all BWRs of a specific type are identical.