



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

February 6, 1991

Docket Numbers 50-317
50-318

LICENSEE: Baltimore Gas and Electric Company
FACILITY: Calvert Cliffs Nuclear Power Plant - Units 1 and 2
SUBJECT: SUMMARY OF MEETING WITH BALTIMORE GAS AND ELECTRIC CONCERNING
LIFE CYCLE MANAGEMENT AND GENERIC LICENSE RENEWAL ISSUES

On Tuesday, January 15, 1991 representatives from Baltimore Gas and Electric's (BG&E) Calvert Cliffs Nuclear Power Plant (CCNPP) made a presentation to the NRC staff and interested members of the public. BG&E discussed ongoing activities at CCNPP regarding life cycle management (LCM), and the relationship between LCM and license renewal issues. The meeting was held at the request of NRC staff. Additionally, BG&E emphasized that the presentation was neither a formal announcement regarding license renewal plans for CCNPP, nor a proposal to consider CCNPP as a "lead" plant for the industry's license renewal efforts. Enclosure 1 is a list of the attendees and Enclosure 2 is a copy of the information discussed at the meeting.

The precursor to BG&E's present life cycle management program began on a small scale in 1985. Those early efforts included identifying and evaluating high priority items, and defining objectives for the LCM undertaking. Evaluations and assessments of selected areas and topics began in 1987. A complete list of the tasks completed through 1990 is included in Enclosure 2. As a result of these efforts, BG&E concluded that there were no significant obstacles to the long term operation of CCNPP. Furthermore, the initiation of the life cycle management program now would maintain the utility's options and flexibility with regard to license renewal as the plant ages.

BG&E also discussed the preliminary results from the implementation of their screening methodology. The methodology, which was developed to identify the structures, systems and components important to license renewal and to power production, is based on both NUMARC's approach and information obtained by the utility during participation at industry sponsored workshops. BG&E's screening methodology does not incorporate Probabilistic Risk Assessment (PRA).

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Jeffrey III

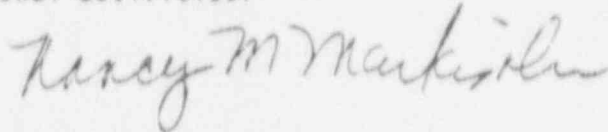
Central File

Baltimore Gas & Electric Co.

-2-

February 6, 1991

Comments from the NRC staff at the conclusion of BG&E's presentation noted that the effort at CCNPP has been impressive and provided valuable insight into life cycle management and related license renewal issues. BG&E noted that as a result of these activities, they have achieved a better understanding of their own organization, existing programs and practices, and plant safety. The NRC staff encouraged BG&E to continue with their life cycle management effort, and not to postpone related license renewal activities.



Nancy M. Markisohn
License Renewal Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:
As stated

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/s/

Nancy M. Markisohn
License Renewal Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

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DISTRIBUTION

Central File		J. Richardson	NRR
Meeting Attendees		A. Thadani	NRR
T. Murley	NRR	C. Heltemes	RES
F. Miraglia	NRR	R. Boenak	RES
F. Gillespie	NRR	W. Minners	RES
J. Partlow	NRR	NRC & Local PDRs	
W. Russell	NRR	LRPD R/F	NRR
K. Brockman	EDO	LRPD Staff	NRR
J. Linville	RI	J. Vora	RES
K. Abraham	RI	G. Sege	RES
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*See previous concurrence

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King of Prussia, Pennsylvania 19406

Meeting Between NRC and BG&E to Discuss Life Cycle
Management and Related License Renewal Issues

January 15, 1991

Attendance List

<u>NAME</u>	<u>ORGANIZATION/COMPANY</u>
Bruce Montgomery	BG&E
P.G. Chabot	BG&E
Jay Silberg	Shaw Pittman
Jim Bennett	BG&E
Raj Anand	NRR/LRPD
Barth W. Doroshuk	BG&E
Charlie Cruse	BG&E
John Craig	NRC/NRR/LRPD
Dennis M. Crutchfield	NRC/NRR/DAR
Francis Akstulewicz	NRC/NRR/LRPD
Ken Hoopingarner	PNL (Battelle)
Tricia Heroux	NUMARC
Deborah Staudinger	Toledo Edison
Robert Borsum	BWNT
David Tang	NRR/LRPD
J.H. Taylor	B&W Nuclear Technologies
P.T. Kuo	NRR/PDLR
J.J. Burns	RES/EMEB
G.H. Weidenhamer	RES/EMEB
R.W. Parkhill	NRR/DAR/PDLR
Debbie Jackson	NRR/DAR/PDLR
Ann Mooney	BG&E
T.J. Kim	NRR/PDLR
R.W. Borchardt	NRR/DAR
Paul C. Shemanski	NRR/PDLR
S. Lee	NRR/PDLR
Nancy Markisohn	NRR/PDLR
Ralph Caruso	NRR/DST
Geary S. Mizuno	OGC/
Robert E. Sweeney	Yankee Atomic Electric Co.
Patrick Harris	SERCH Licensing/Bechtel
Charles B. Brinkman	ABB Combustion Engineering
William Travers	NRC/DAP
Daniel McDonald	NRC/DRP/PM
Kamal Manoly	NRC/NRR/DET
John O. Thoma	NRC/NRR/DAR/LRPD

Life Cycle Management Program



Calvert Cliffs Nuclear Power Plant
Life Cycle Management Program

Presentation to the
Nuclear Regulatory Commission
January 15, 1991



Purpose of Meeting

- Discuss BG&E Activities in Life Cycle Management
- Provide NRC with BG&E Perspective on License Renewal Issues



This Meeting is NOT:

- A Formal Announcement for License Renewal Applications by BG&E
- A Proposal for Calvert Cliffs to be Considered a "Lead" Plant



Calvert Cliffs Early Efforts

- Started Small - Evaluated "High Priority" Items
- Objectives
 - Establish Corporate Awareness
 - Show Value
 - Serve as a Planning Basis for LCM

COMPLETED TASKS - CHRONOLOGICAL OVERVIEW

1988

- Applicants Assessment of Surry Life Extension Reports (CEOG)
- Reactor Vessel Service Life Evaluation
- Reactor Internals Service Life Evaluation
- Integrated Surveillance Program

1989

- Reactor Vessel Assessment of Degradation Mechanisms of Low Concern
- Assessment of Primary Water Stress Corrosion Cracking
- Assessment of Low Temperature Sensitization of Austenitic Stainless Steel
- Fatigue Assessment
- Reactor Vessel Weld Materials
- Flux/Fluence Accuracy Evaluation

COMPLETED TASKS - CHRONOLOGICAL OVERVIEW

1990

- Reactor Coolant System Service Life Evaluation
- Reactor Coolant Pump Service Life Evaluation
- Reactor Internals Assessment of Degradation Mechanisms of Low Concern
- Systems, Structures and Components Screening Methodology
- Procedure for Screening ITLR Systems and Structures (including results of screening)
- Procedure for Screening ITLR Components of ITLR Systems (including results of screening pilot system)
- Procedure for Screening ITPP Systems and Structures



COMPLETED TASKS - CHRONOLOGICAL OVERVIEW

1990 (Con't)

- Procedure for Screening ITPP Components of ITPP Systems
- Component Evaluation Methodology (Draft)
- LCM DATA Software System
- Reactor Vessel Program Plan
- Formal Fatigue Monitoring Implementation
- LCM Program Management Plan
- Industry Report Efforts
- Capsule Tooling Plan Design

Overall Plant Conclusions

- No Significant Obstacles to CCNPP Long Term Operation
- Thermal Transient and Fatigue Monitoring of "Critical" Components should be improved
- Prevention/Verification Actions to Manage Aging in Current Operating Term Necessary
- Increased Long Term Reliability and Performance due to Aging Management
- Integrated Approach within BG&E Necessary

Overall Corporate Findings

- Initiating Life Cycle Management Efforts Now will Allow us to Maintain Flexibility and Multiple Options



CCNPP Long Term Goal #3

"Position the Company to Operate Calvert Cliffs up to and Beyond its Current Licensed Lifetime"

Life Cycle Management Definition

An integrated program to maintain the material condition of important systems, structures and components through the current and any renewed license terms.

License Renewal Definition

The collection and presentation of that information necessary to allow the NRC to renew the plants' operating licenses



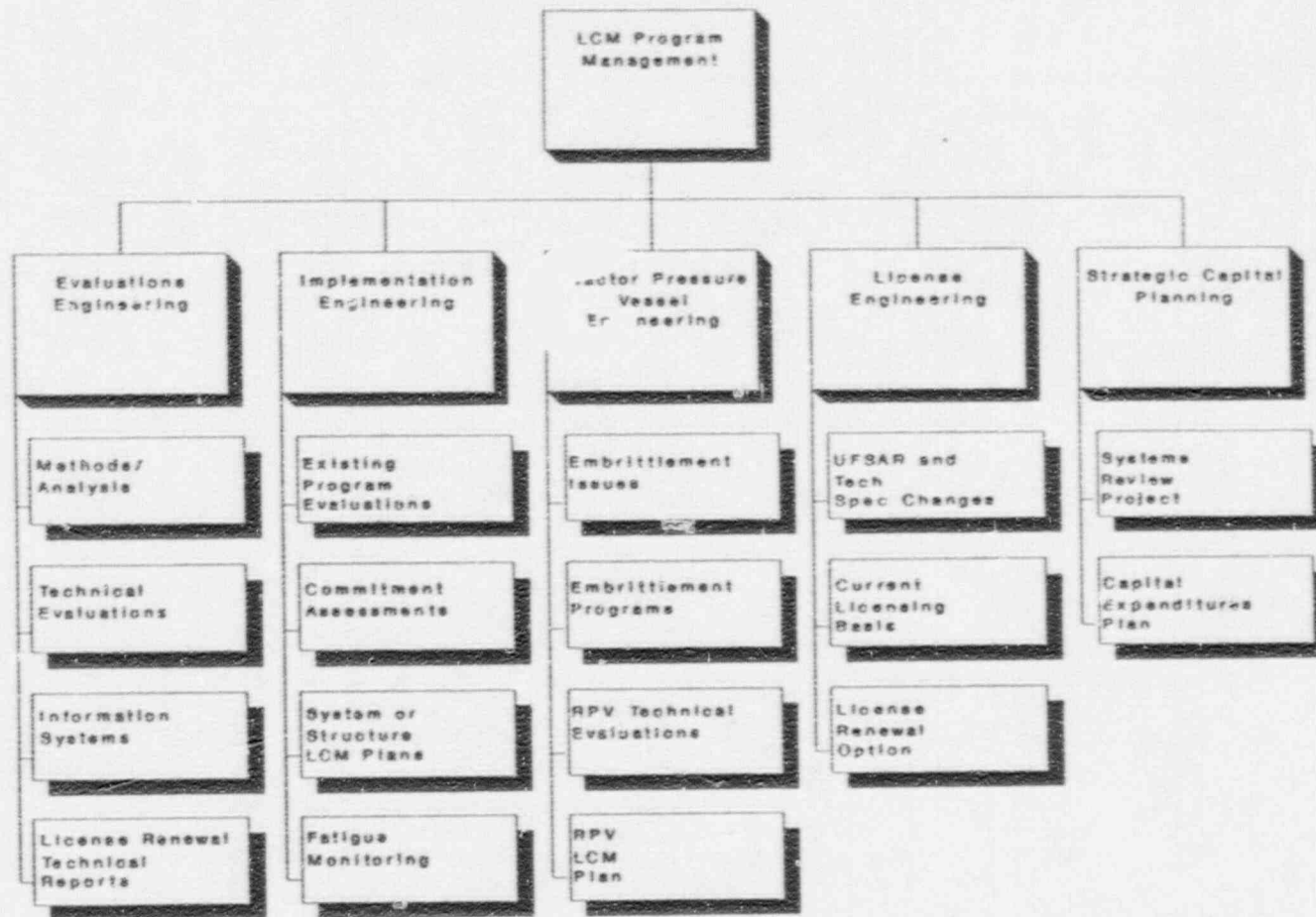
LCM Program Objectives

- Operate Safely and Reliably
- Preserve the License Renewal Option

Objectives of Program Management Plan

- "Define" Requirements for both LCM and the Option for Renewal
- Identify Organizational Relationships
- Identify Tasks/Resources/Schedules
- Provide Guidance on Control

LCM Functional Requirements Chart





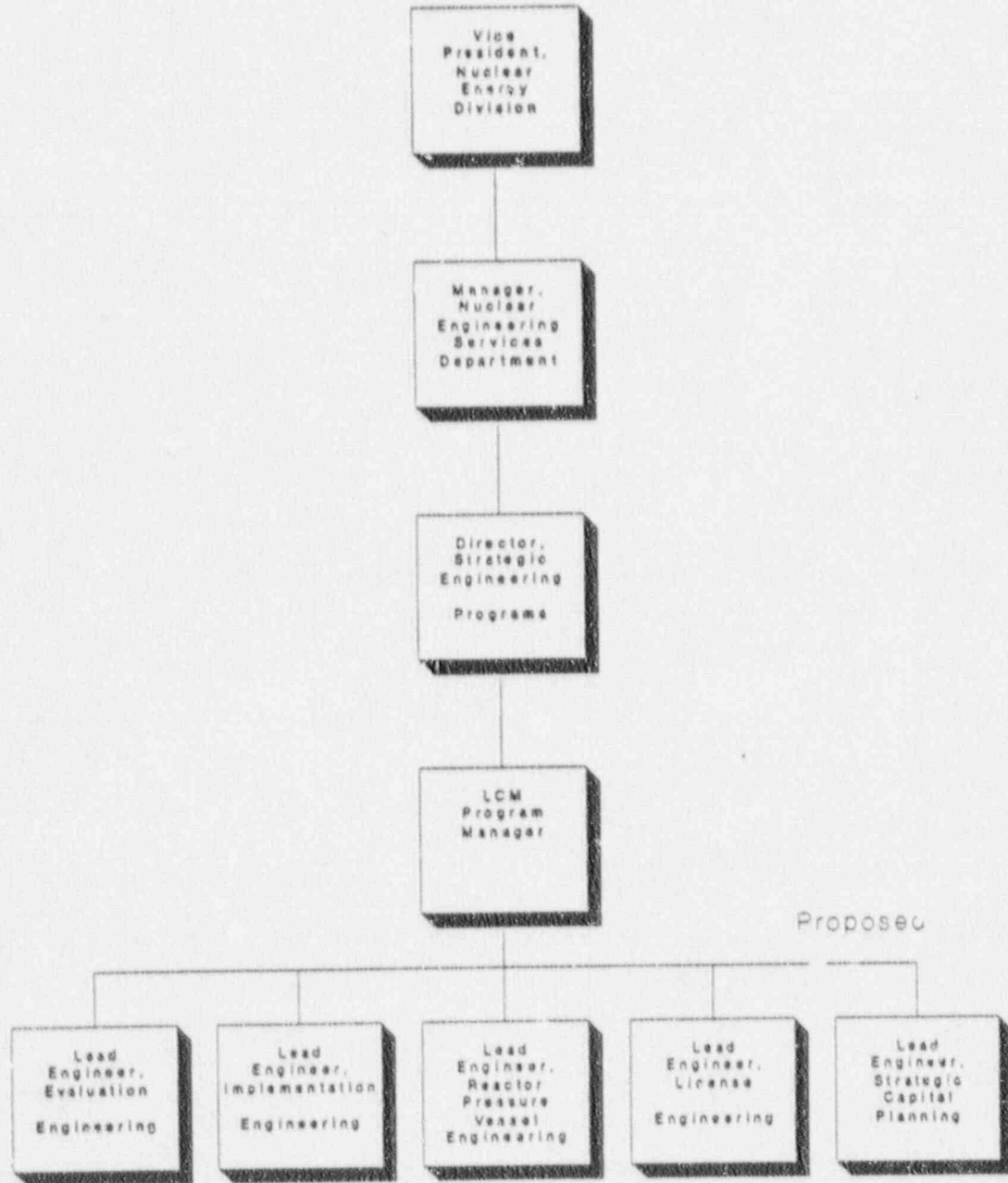
For Strategic Planning,
CCNPP will be in the Position to
Decide on LR Submittal by 1998



BG&E LCM

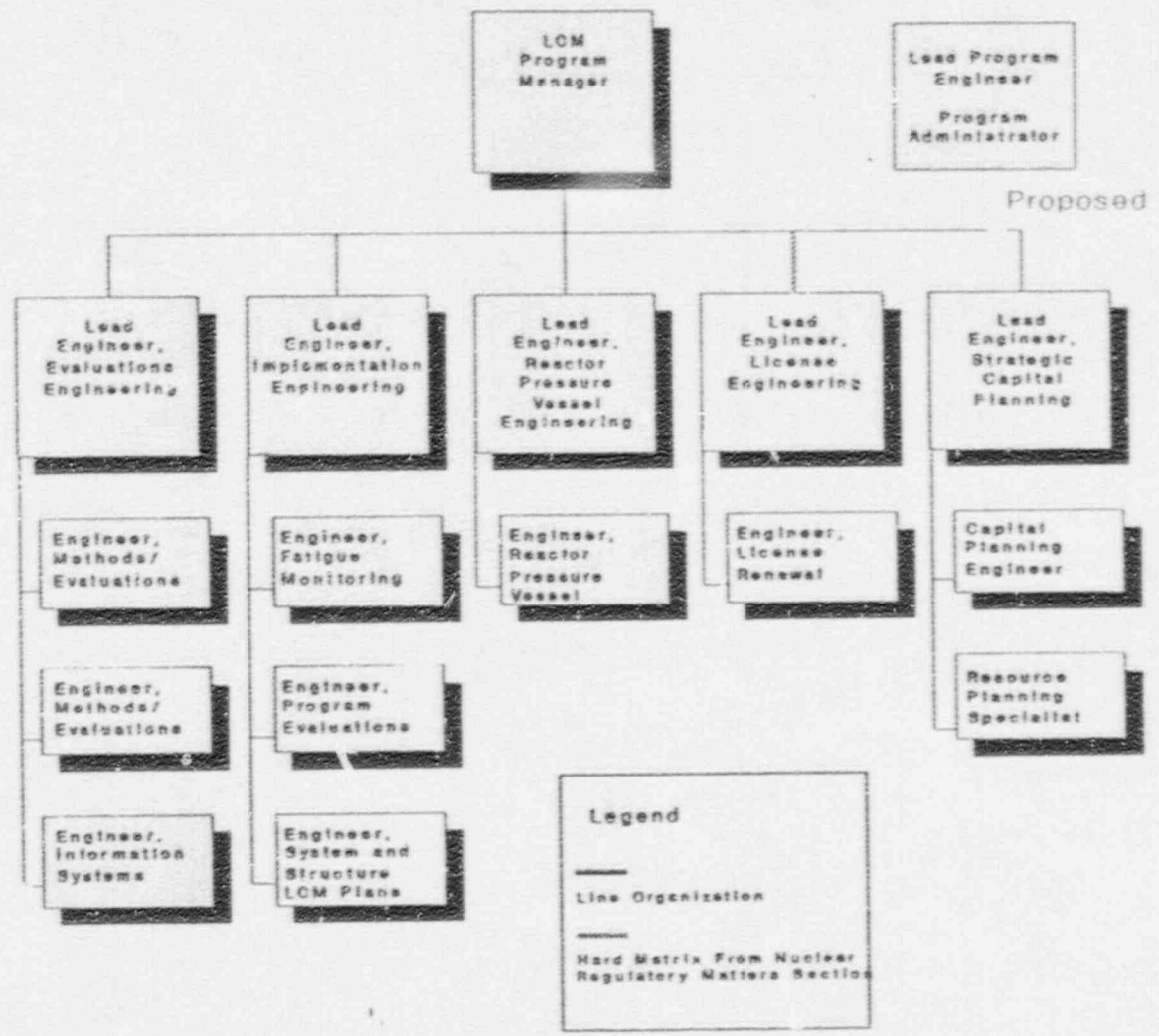
Line Organization Chart

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LCM LINE ORGANIZATION CHART

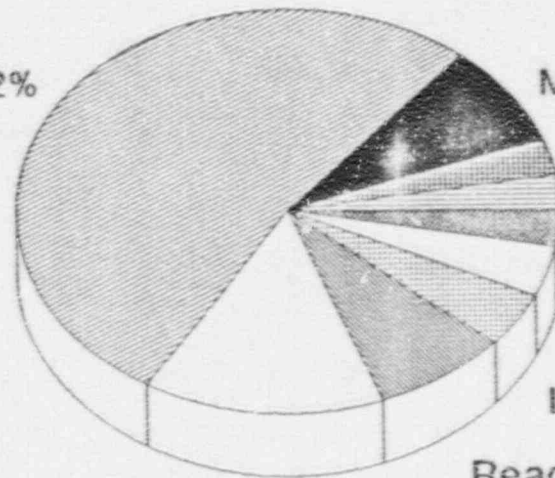
(1991)



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Systems ARDM Work 52%
(Integrated Plant Assessment)



Management 9%

Additional Tech Eval 3%
LRA Technical Rpts 3%

Fatigue Monitoring 3%
Methods Development 4%
LCM DATA Software 4%

Reactor Vessel Eng 8%

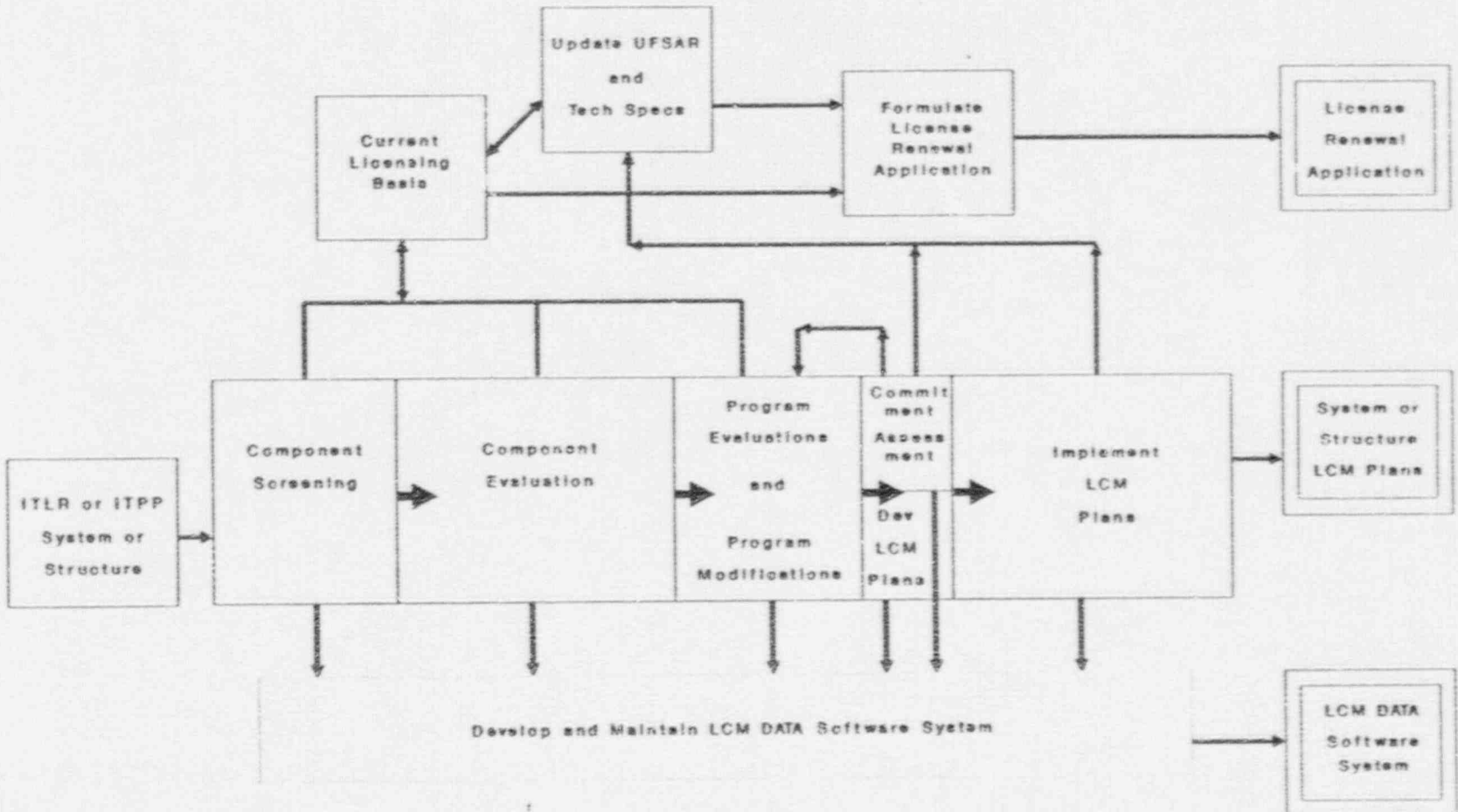
License Renewal Eng 14%

LCM Program Resource Allocation

(1991 - 2001)

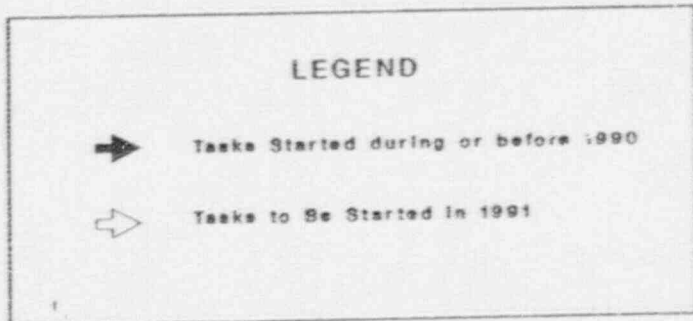
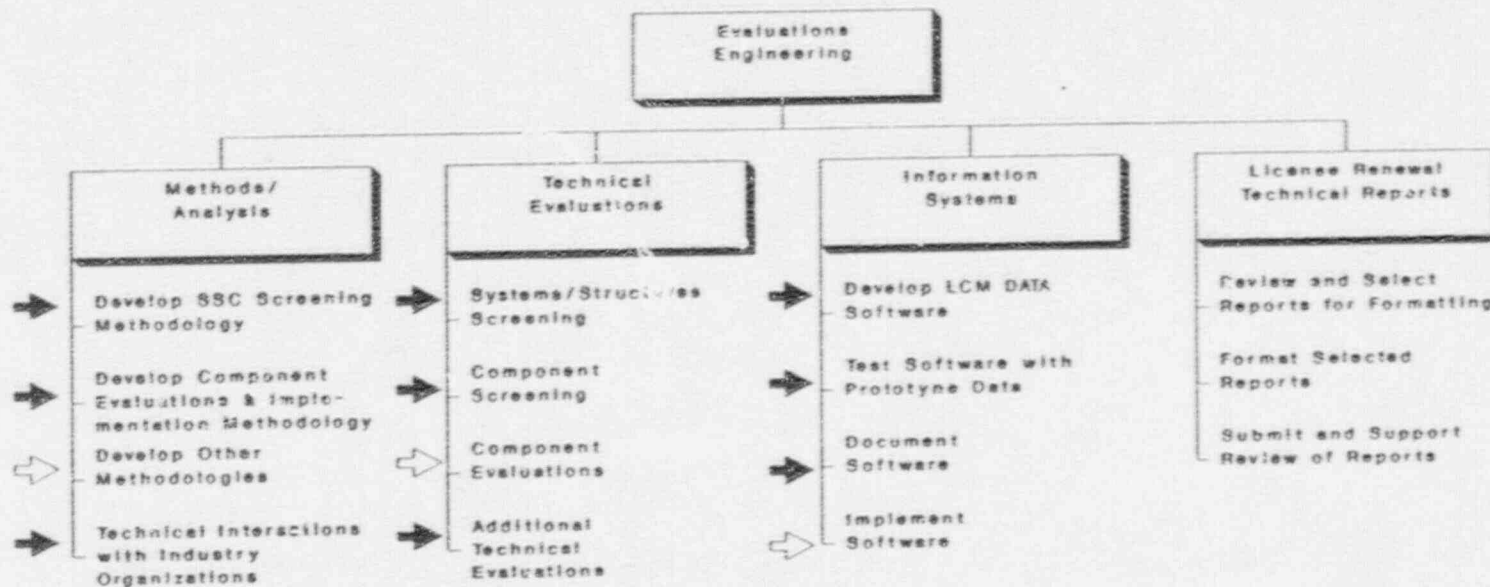
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LCM Program Activity Flow Diagram

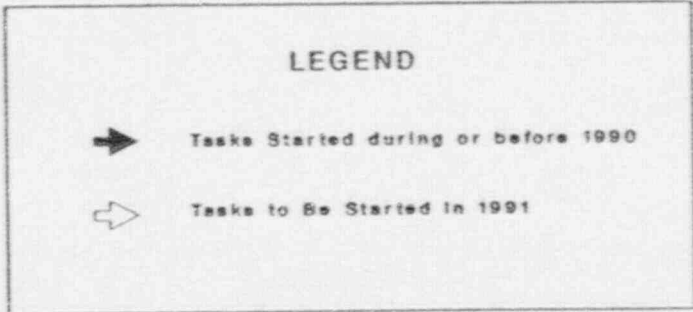
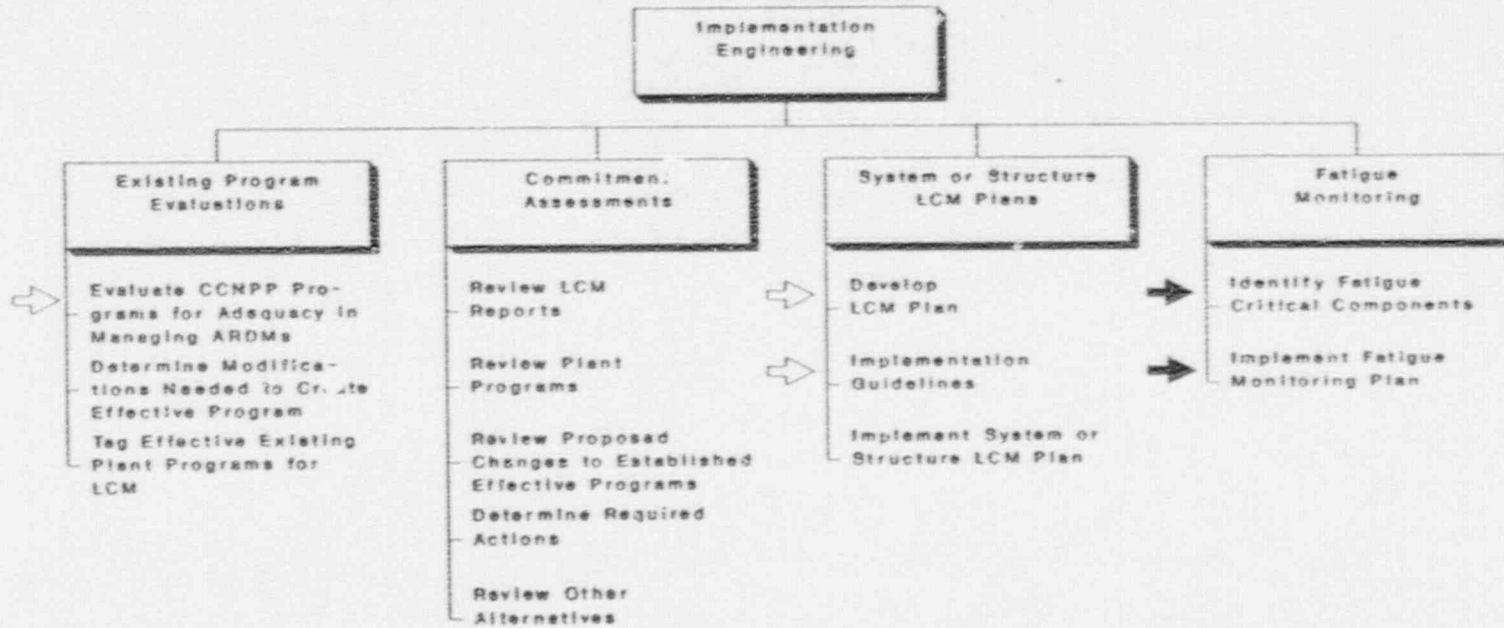


Functional Activity Tasks

Evaluations Engineering

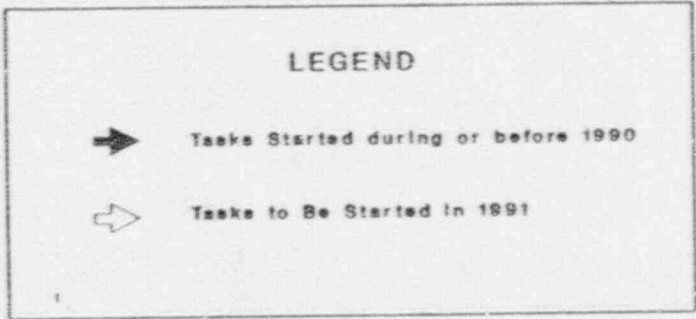
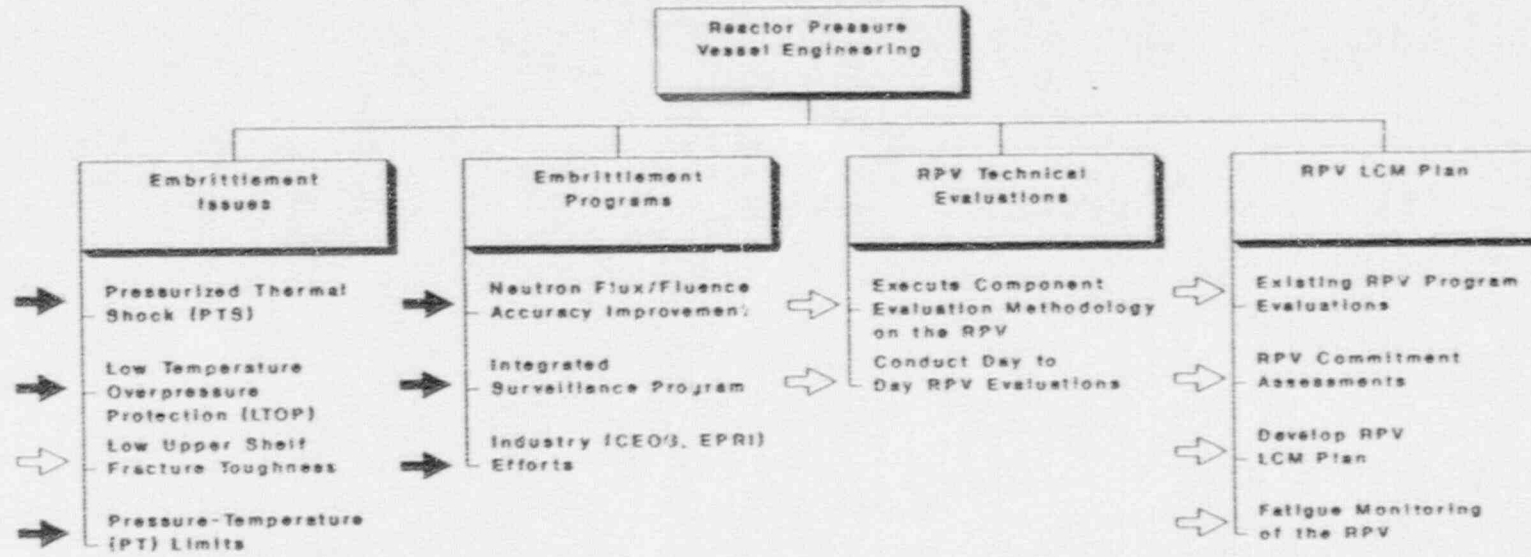


Functional Activity Tasks Implementation Engineering



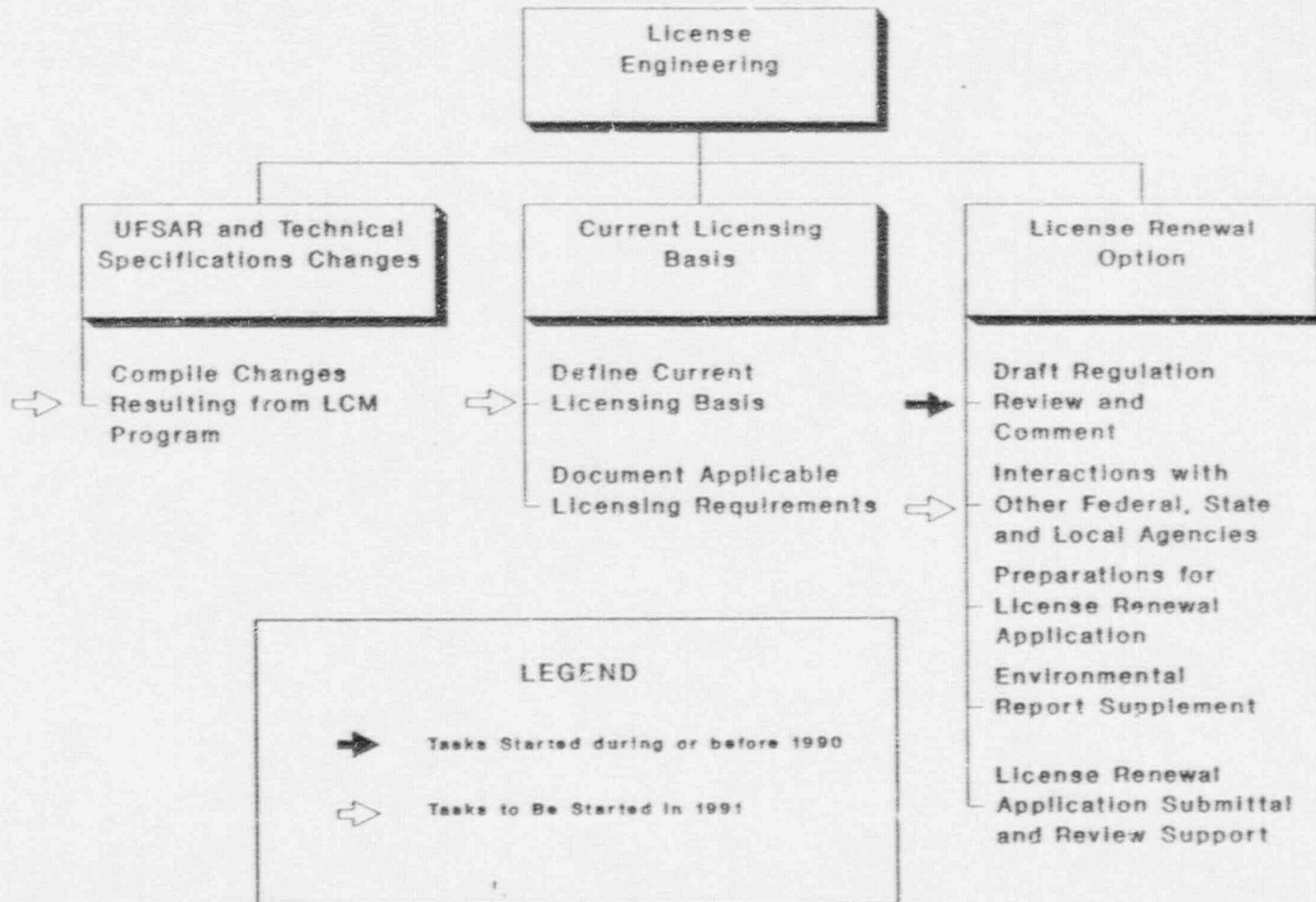
Functional Activity Tasks

Reactor Pressure Vessel Engineering

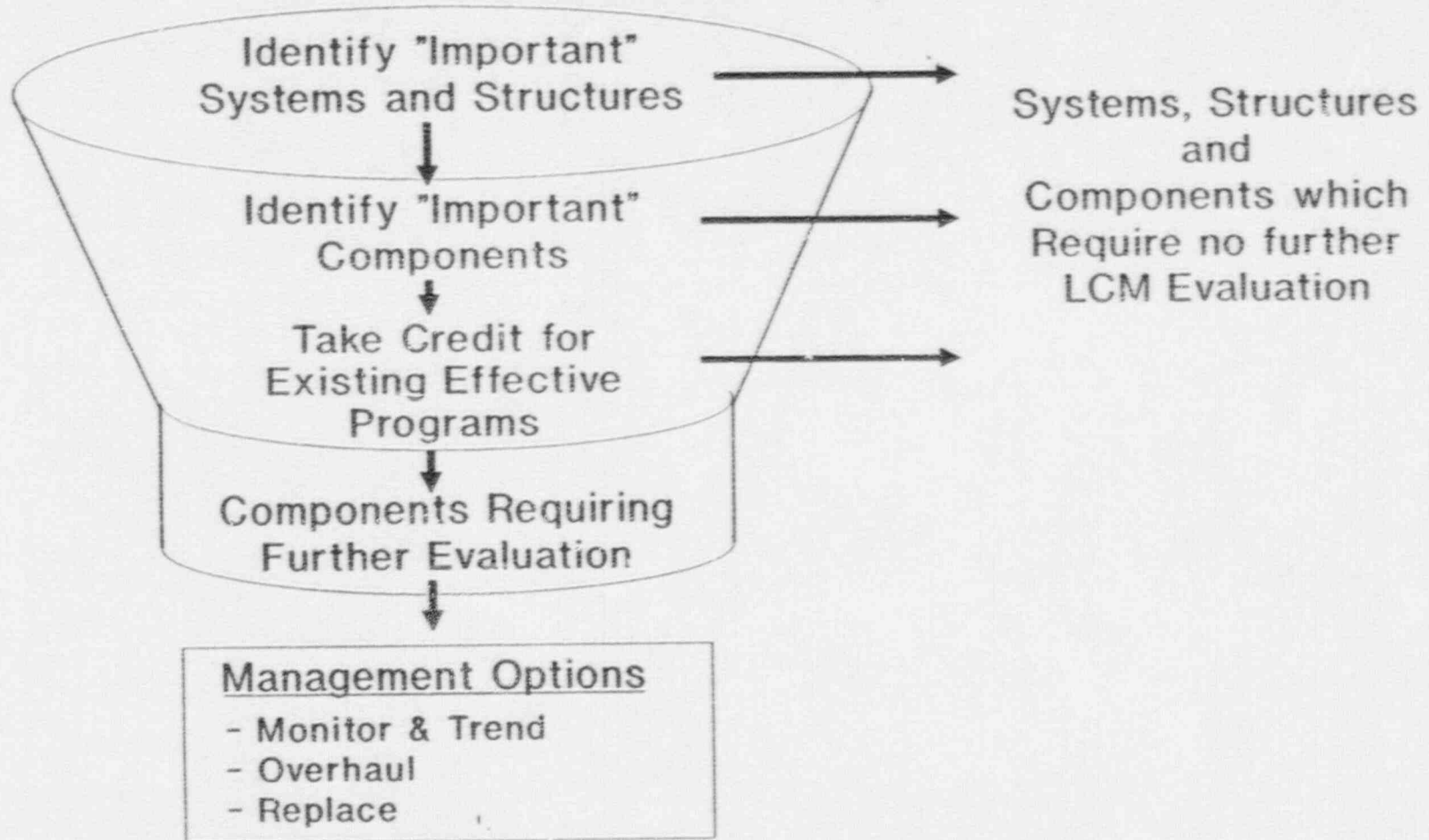


Functional Activity Tasks

License Engineering



CCNPP Screening Process



SYSTEM AND STRUCTURE SCREENING


All Plant Systems and Structures
- Conceptual boundaries
- Functional descriptions


Legend

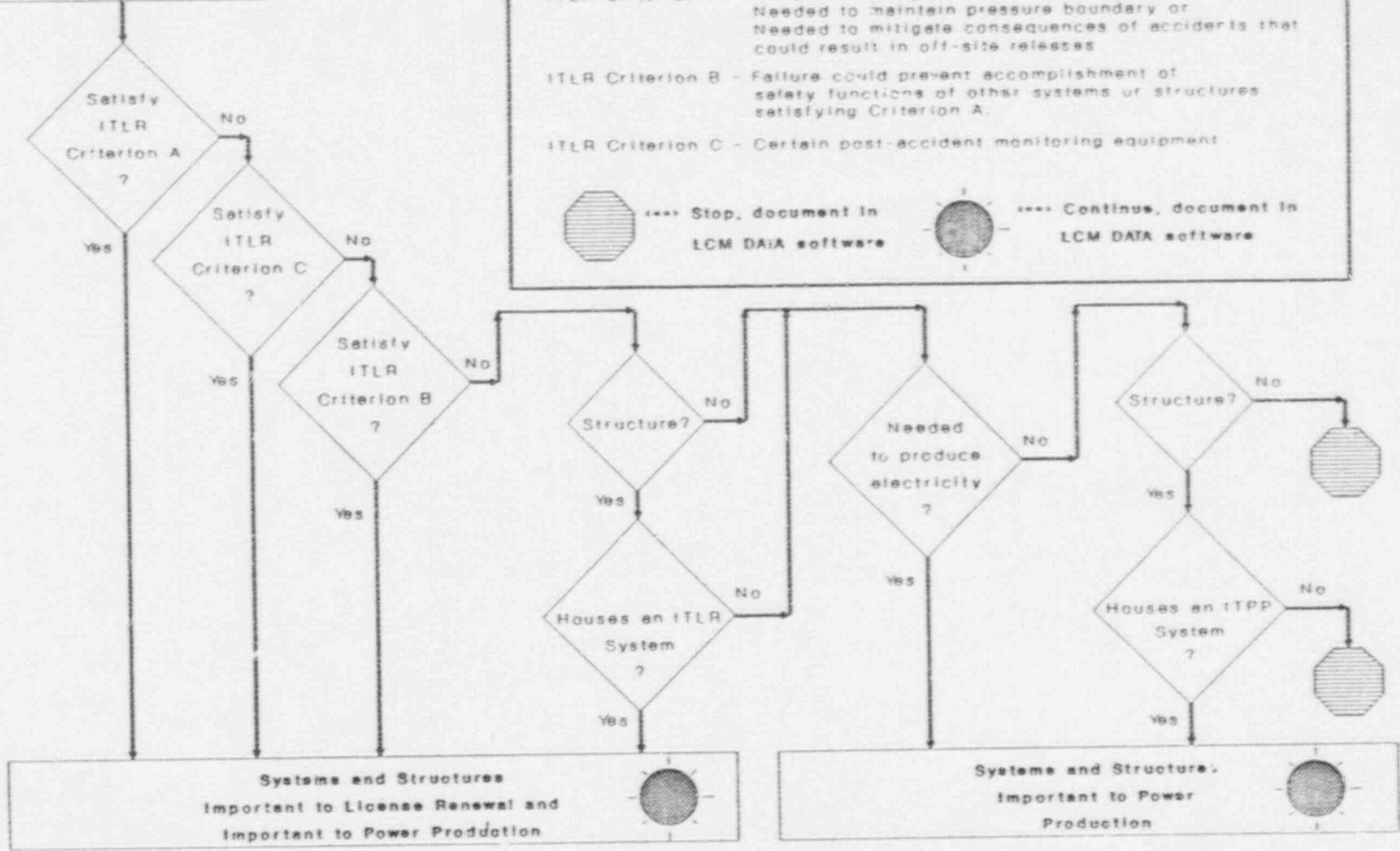
ITLR Criterion A - Needed to bring plant to safe shutdown or Needed to maintain pressure boundary or Needed to mitigate consequences of accidents that could result in off-site releases

ITLR Criterion B - Failure could prevent accomplishment of safety functions of other systems or structures satisfying Criterion A.

ITLR Criterion C - Certain post-accident monitoring equipment.

 Stop, document in LCM DAIA software

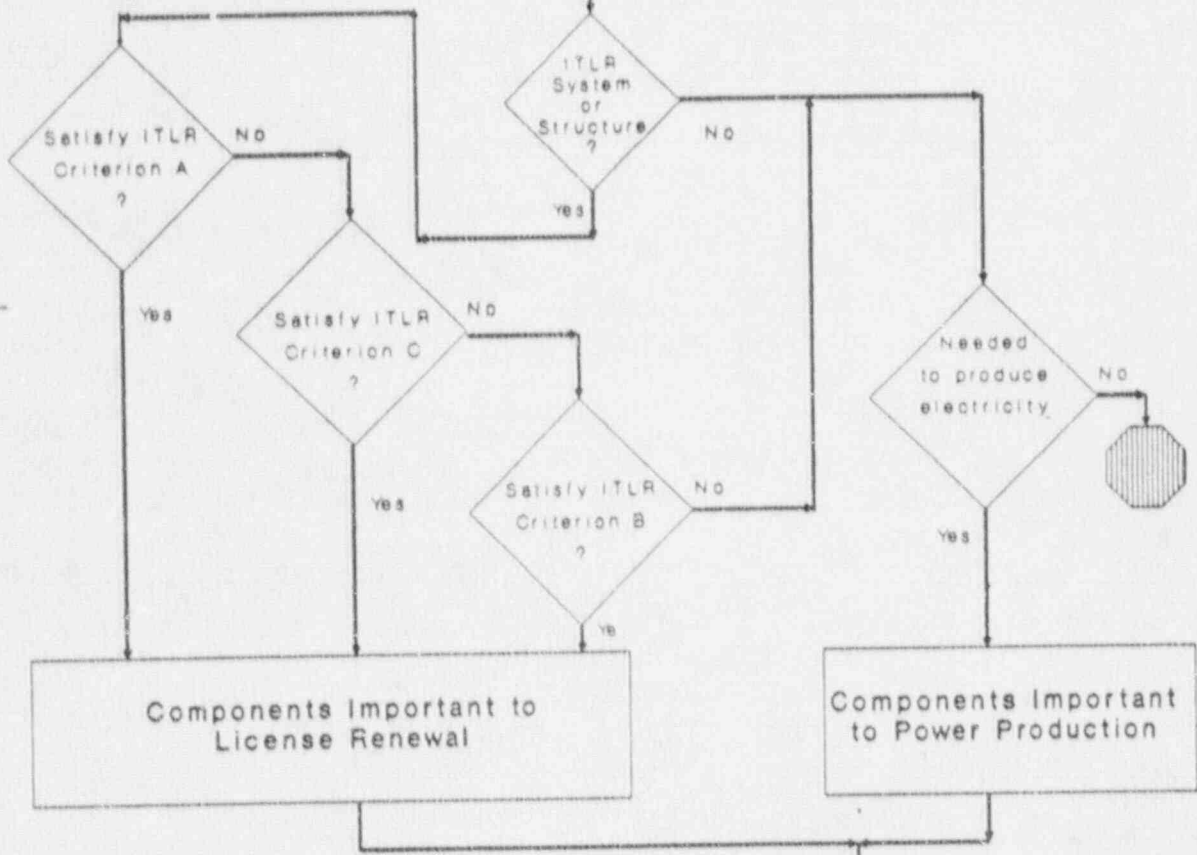
 Continue, document in LCM DATA software





COMPONENT LEVEL SCREENING

System or Structure
 - Document boundaries
 - Complete components list
 - Detailed list of functions



LEGEND

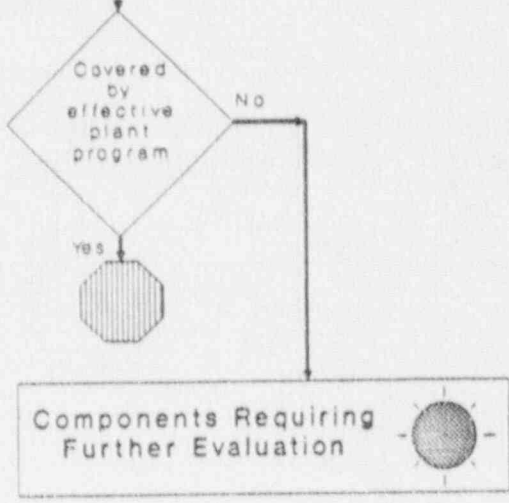
ITLR Criterion A - Needed to bring Plant to safe shut-down or needed to maintain pressure boundary or needed to mitigate the consequences of accidents that could result in off-site releases in excess of Part 100

ITLR Criterion B - Failure could prevent accomplishment of safety functions of safety-related systems

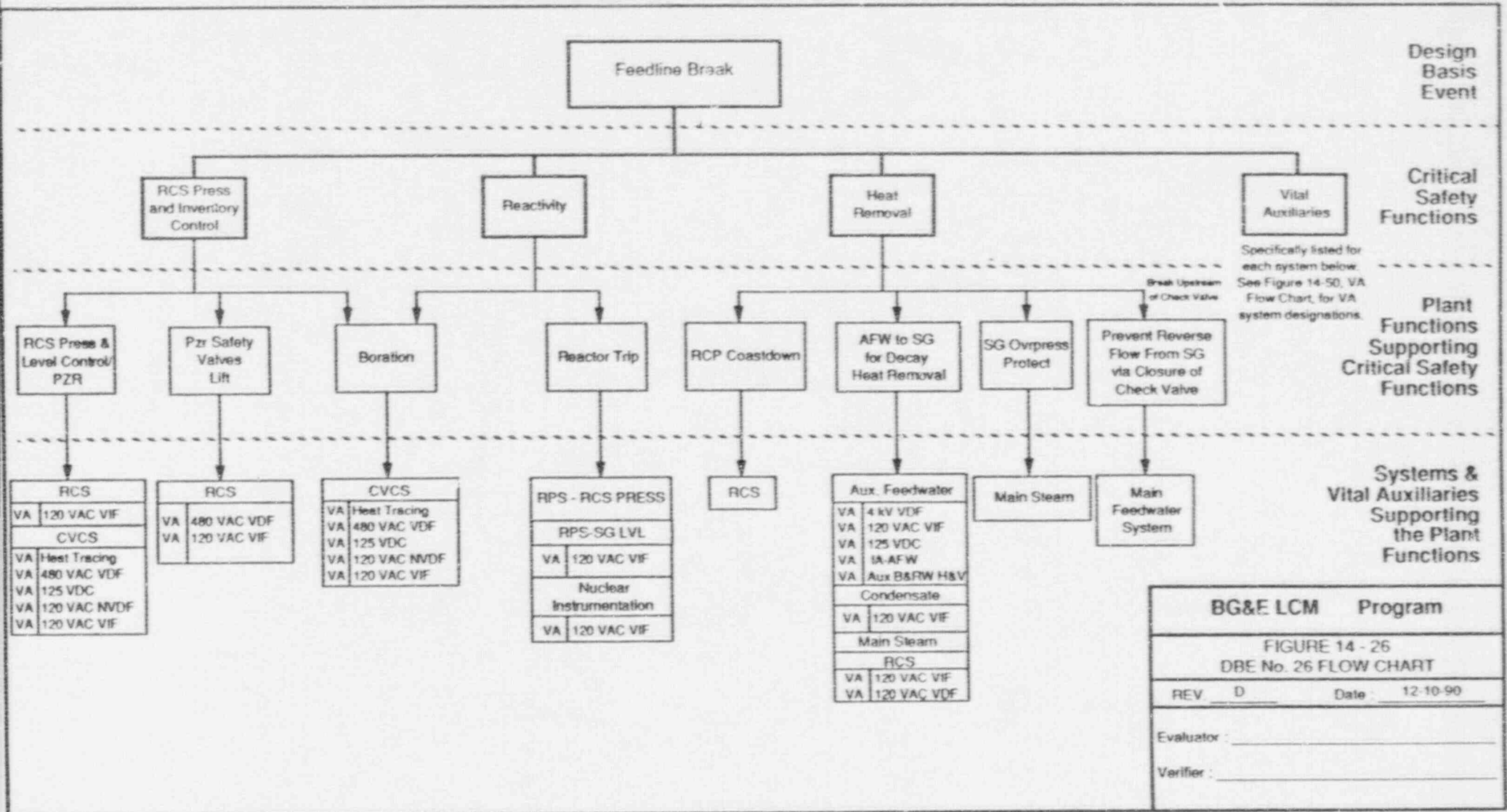
ITLR Criterion C - Post-Accident Monitoring Equipment

- STOP. Document in LCM DATA Software

- CONTINUE. Document in LCM DATA Software



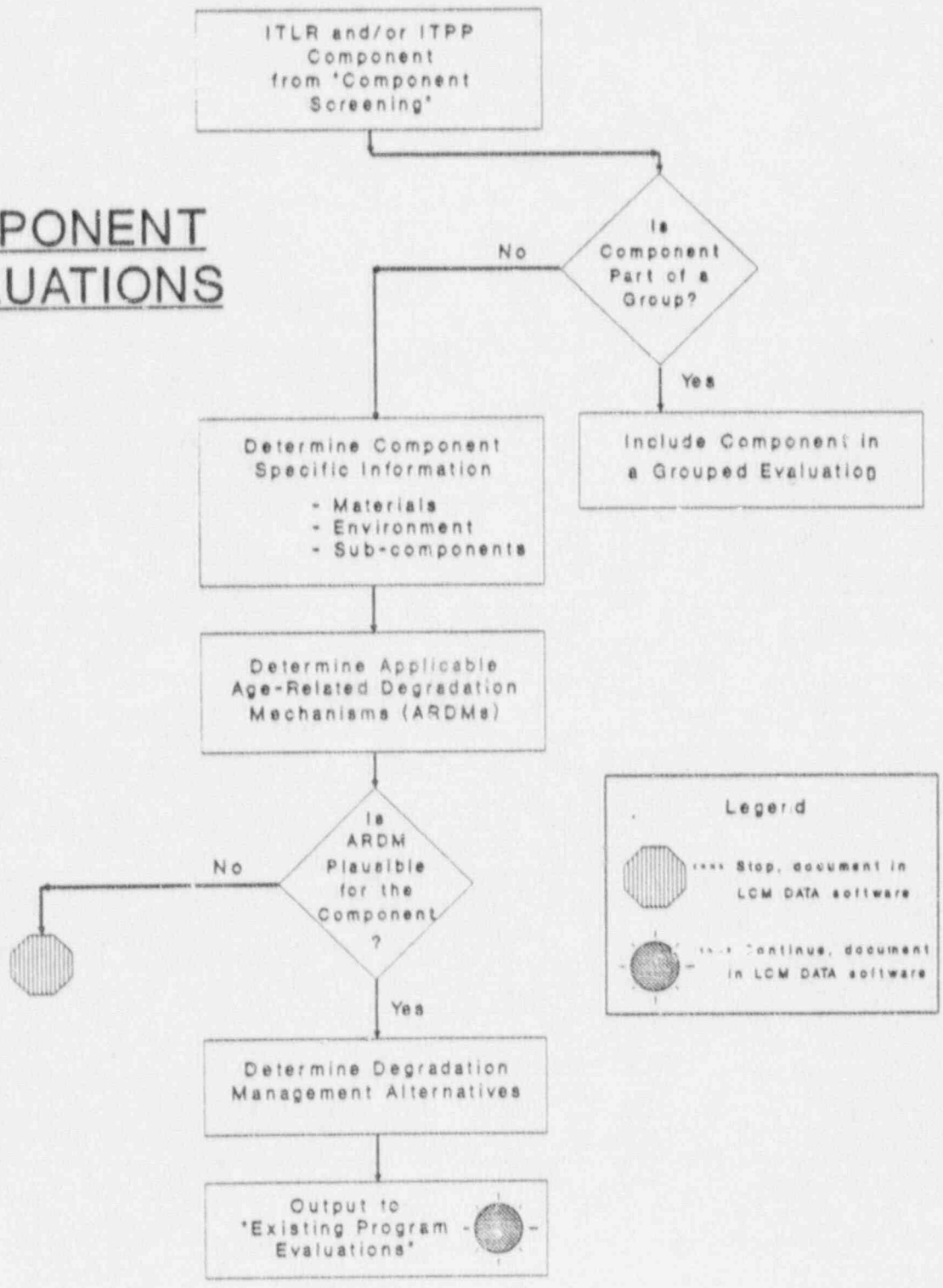
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COMPONENT EVALUATIONS

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Legend

- Stop, document in LCM DATA software
- Continue, document in LCM DATA software

Project Interface Resolution

- Many BG&E Projects Have Significant Interfaces
 - Life Cycle Management
 - Design Basis Consolidation (DBC)
 - Individual Plant Evaluation (IPE)
 - Reliability Centered Maintenance (RCM)
 - Regulatory Commitment Management Project
 - Systems Review Project (SRP)
- Interface Plan Developed and Implemented in August 1990



Project Interface Pilot Application

- Trial Application on Pilot Systems.
 - Instrument Air: IPE, DBC, LCM, SRP
 - Salt Water: IPE/RCM, LCM, SRP
 - RCS: DBC, LCM
- Identification of Lessons Learned
- Modifications of Programs and Interfaces
- Performed in 1991 and 1992
- Part of Detailed 2-Year Plan



1991 LCM Program Objectives

- Continue Project Interface Definition
- Perform Component Level Screening of 13 Systems
- Develop Procedures for Component Evaluation and Apply Procedures to 9 Systems
- Continue Implementation of LCM DATA Software System

ITLR Systems and Structure Screening Status

- Completed Tasks
 - Identification of System/Structure Descriptions and Functional Requirements
 - Design Basis Event Flow Charts
 - EOP/AOP Screening Tool
 - ATWS Screening Tool
 - PTS Screening Tool
 - EQ Review
 - Post Accident Monitoring Screening Tool
 - Screening of All CCNPP Systems and Structures

- Outstanding Tasks
 - Resolve Comments
 - Review Results
 - Revise Procedure Where Necessary
 - Repeat Necessary Steps

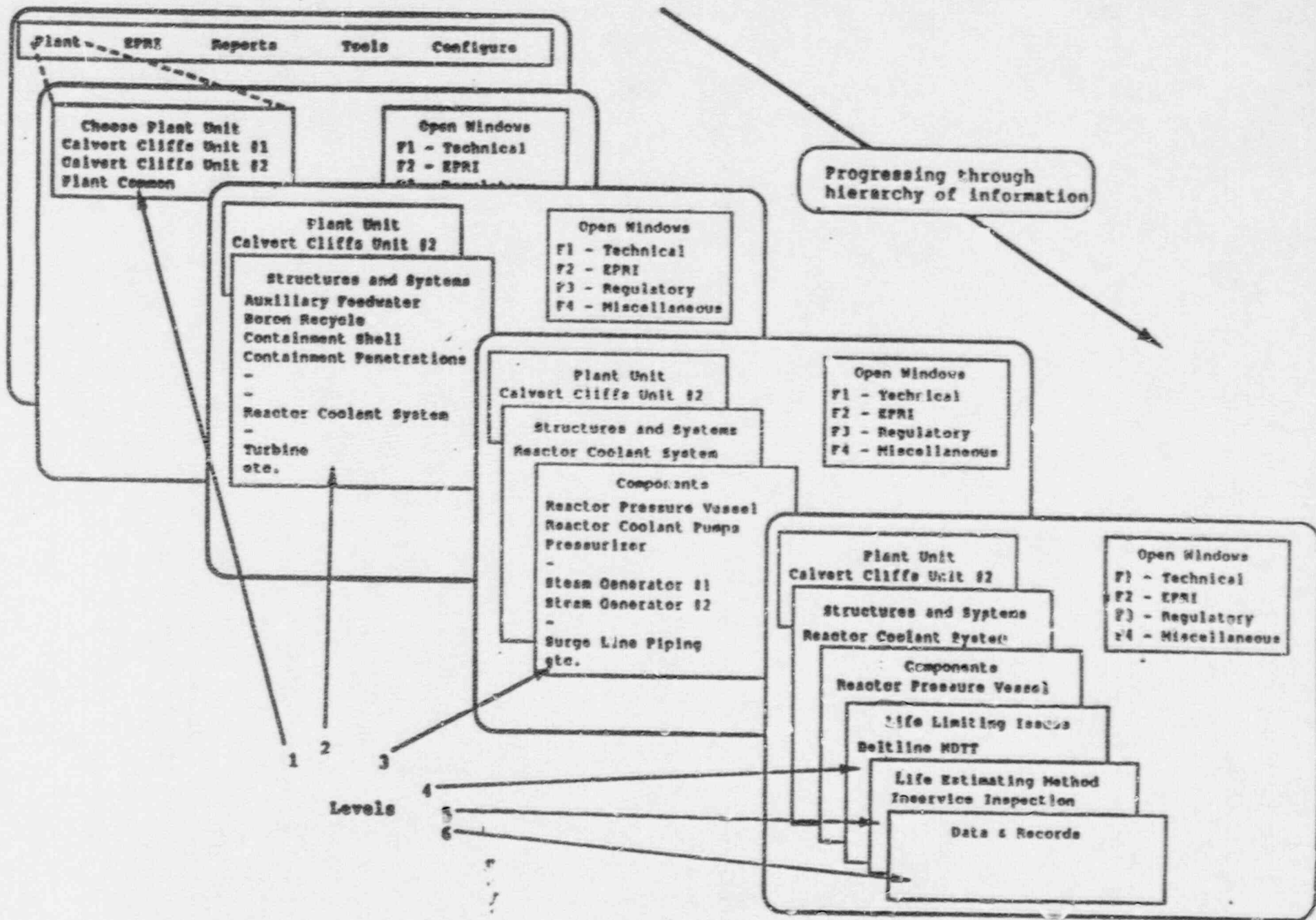
ITLR Systems and Structure Screening Preliminary Findings

- Total Number of Systems and Structures Screened
 - 86 of 101 Systems
 - 19 of 30 Structures
 - 105 of 131 Systems and Structures
- Most of the Remaining 26 Systems and Structures are Expected to Screen as not ITLR.
- ITLR Determination
 - Initially 80% of S/Ss screened as ITLR

ITLR Component Level Screening Status

- Completed Tasks
 - Preparation of Procedure for Systems
 - System Boundaries, Master Equipment Lists Completed for Reactor Coolant System, Compressed Air System and Salt Water System
 - Detailed System Functions Listed for 3 Systems
 - Component - Function Catalogs Prepared for 3 Systems
 - Final Screening Complete For RCS

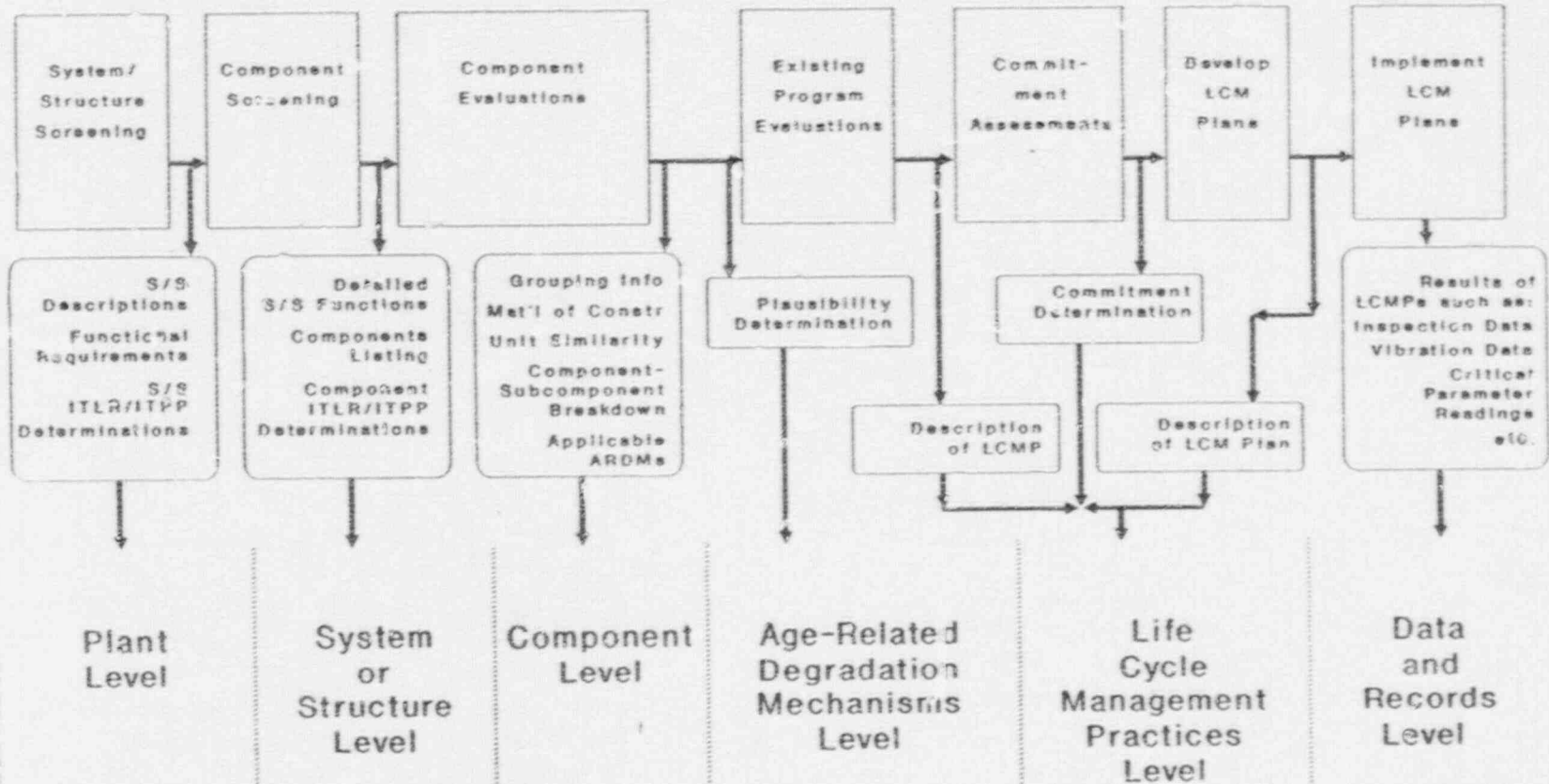
- Outstanding 1991 Component Screening Tasks
 - Complete Screening of 3 Pilot Systems
 - Conduct Component Level Screening on 10 Additional Systems
 - Develop Screening Procedure for Structures



Life Cycle Management Program



IPA Tasks VS LCM DATA Levels



LCM DATA Software System

Lessons Learned - Program Management

- Written "Standard" Policies are Needed for Many Issues Which Arise During the Performance of Program Tasks
 - Technical Problem Reporting
 - Records Management
 - Quality Assurance
 - Control of Procedures
- Some of the Standard Policies Must Address Issues Unique to License Renewal
 - Updating of Program Deliverables to ensure an Up-To-Date FSAR Supplement is Submitted with the License Renewal Application
 - Separating QA Tasks from non-QA Tasks in a Program Evaluating both ITLR and ITPP

Lessons Learned - Screening of Systems

- Key to Successful Screening is to Assemble the "Functions" of Systems and Structures
- Integration of Site Activities is Essential to Performing the Most Efficient Screening
- Avoid Identifying all Alternative Methods of Responding to Abnormal and Emergency Events
- Providing a Basis for the "Not Important" Determination is Challenging Because of the Difficulty of "Proving the Negative"

Lessons Learned - Screening of Structures

- Component Level Screening of Structures may Differ from Screening of Systems
- Functions of Structures include the Support/Housing of Equipment, Therefore the Importance of Structures is Directly Related to the Importance of What is Supported/Housed.
- Until All Systems Have Been Screened, the Importance of the Components Supported/Housed is not Clearly Documented.
- BG&E Developing a Separate Screening Process for ITLR Structures



Lessons Learned - Component Level Screening

- Initial Steps Proved More Difficult Than Anticipated
 - System Boundaries
 - Component-Subcomponent Breakdown for the Master Component List
- Currently Proposed Guidance for Exclusion Criteria is Difficult or Impossible to Implement
- BG&E Methodology Instead Involves an Exhaustive Search Process to Determine the Components Which are Important
 - Components Which are not Identified as Contributing to any ITLR Function of the Parent System are Screened Out

Lessons Learned - Effective Programs

- LCM Program will Develop Effective Program Evaluation Methodology During 1991
- BG&E Believes That There are Many Programs which can be Considered Effective Based on Experience
- Draft Reg Guide 1009 and NUREG 1299 are Inconsistent on this Matter
 - Agree with Experience Based "Effectiveness"
 - Disagree by Requiring Exhaustive Aging Evaluations



1991 PLANS

Life Cycle Management Program

1991 LCM Program Objectives

- Continue Implementation of Vessel Programs and Integrate These Efforts into Vessel LCM Plan
- Continue Implementation of Fatigue Monitoring Program
- Continue Monitoring Regulatory Environment



Conclusions

- Significant Progress is Being Made