

Carolina Power & Light Company

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OCT 10 1989

A. B CUTTER
Vice President
Nuclear Services Department

SERIAL: NLS-89-097
10 CFR 50.90
TSC 89TSB02

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Parts 50.90 and 2.101, Carolina Power & Light Company (CP&L) hereby requests a revision to the Technical Specifications for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2.

The proposed amendment increases the allowable primary containment leakage rates (L_a and L_t) specified in Technical Specification 3.6.1.2, Primary Containment Leakage. L_a is increased from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig. L_t is increased from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig. The Bases Section for Technical Specification 3.6.1.2 has been revised to reflect this change and is included for your information.

Enclosure 1 provides a detailed description of the proposed changes and the basis for the changes.

Enclosure 2 details the basis for the Company's determination that the proposed changes do not involve a significant hazards consideration.

Enclosure 3 is an environmental evaluation which demonstrates that the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9); therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the amendment.

Enclosure 4 provides instructions for incorporation of the proposed changes into the Technical Specifications for each unit.

Enclosure 5 provides a summary of the proposed Technical Specification changes for each unit on a page by page basis.

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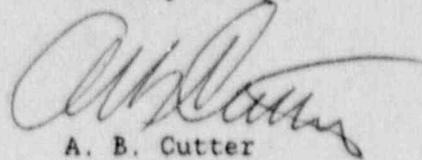
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Enclosures 6 and 7 provide the proposed Technical Specification pages for Units 1 and 2, respectively. The revised Bases Sections are also included for your information.

Enclosure 8 contains the calculations which form the basis for this amendment request.

Please refer any questions regarding this submittal to Mr. M. R. Oates at (919) 546-6063.

Yours very truly,



A. B. Cutter

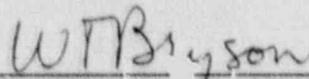
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Enclosures:

1. Basis for Change Request
2. 10CFR50.92 Evaluation
3. Environmental Evaluation
4. Instructions for Incorporation
5. Summary List of Revisions
6. Technical Specification Pages - Unit 1
7. Technical Specification Pages - Unit 2
8. Supporting Calculations for Change Request

cc: Mr. Dayne H. Brown
Mr. S. D. Ebnetter
Mr. W. H. Ruland
Mr. E. G. Tourigny

A. B. Cutter, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.



Notary (Seal)

My commission expires: 8/16/92.

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

BASIS FOR CHANGE REQUEST

Proposed Change

The proposed amendment increases the allowable primary containment leakage rates (L_a and L_t) specified in Technical Specification 3.6.1.2, Primary Containment Leakage. L_a is increased from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig. L_t is increased from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig. The Bases Section for Technical Specification 3.6.1.2 has been revised to reflect this change and is included for your information.

Basis

Increasing the allowable primary containment leakage rates (L_a and L_t) will provide significant safety benefits for the operation of the Brunswick Plant. The current conservative limits have resulted in an increased ILRT failure rate and, therefore, performance of additional ILRTs. One of two Brunswick-1 ILRT failures and three of five Brunswick-2 ILRT failures would have been acceptable with the revised containment leakage rates. Neither unit would be in an accelerated testing frequency if the revised containment leakage rates were in effect.

Specifically, ILRTs place an unnecessary burden on critical management, technical, and monetary resources available for Brunswick. The presence of an ILRT during an outage introduces many work planning, staging, and accomplishment hardships which deflect management and supervisory attention from more consequential safety related work. An unnecessary ILRT increases the scope of an outage which can result in an increased vulnerability to human error, has an impact on ALARA goals, and unduly stresses the primary containment.

Activities related to an ILRT begin months in advance of the outage. These activities involve not only preparation by those engineers directly responsible for the test but also management reviews, planning and scheduling review and incorporation with the overall outage schedule, operations involvement with preparation and planning of clearances, the budgeting process for the project, and contract development with firms outside the Company. These activities represent an unwarranted burden on limited personnel and monetary resources when associated with unnecessary ILRTs. Since resources are limited, work which is possibly more deserving must be dropped from an outage when forced to perform an unnecessary ILRT.

Performance of an unnecessary ILRT introduces undue complexity, cost, and drain on manpower during a critical time for the facility. Key individuals such as Technical Support engineers, instrumentation technicians, and mechanics are involved in the staging of temporary instruments and equipment necessary to run the test. This equipment must be dismantled at the end of the test. Also, a significant effort is involved in properly aligning over 700 valves and establishing the associated clearances in order to prepare for an ILRT. Once again, the valve alignment must be returned to its normal configuration upon completion of the test. Errors are more likely to occur with such a high level of complexity.

A typical ILRT adds approximately one week of critical path time to an outage. Outage activities both in the containment and the reactor building are stopped during performance of an ILRT. As demonstrated above, accelerated integrated leak rate testing results in elevated outage costs, increased outage scope and complexity, and unnecessarily focuses management attention without resulting in a significant safety benefit. Many hours of planning and scheduling precede an outage. An unnecessary ILRT diverts key personnel and resources from higher priority work both prior to and during an outage. It is in the best interest of all concerned to see that outages are managed effectively and that critical resources are focused on safety significant tasks.

The following discussion demonstrates that the allowable containment leakage limits can be increased while maintaining offsite and control room doses within regulatory limits and environmental qualification of equipment as required by 10 CFR 50.49. As such, intent of the regulations can be achieved without a significant impact on the health and safety of either the public or employees.

The existing allowable leakage rates (L_a and L_t) specified in the Brunswick Technical Specifications are 0.5 percent by weight per day at 49 psig and 0.357 percent by weight per day at 25 psig respectively. These values are conservatively low when compared with similar BWRs. For example, the following table provides the L_a values for some other BWRs having Mark I type containments.

<u>Plant</u>	<u>Leak % by weight/day</u>
Browns Ferry	2.0%
Brunswick	0.5%
Cooper	.635%
Dresden	1.6%
Duane Arnold	2.0%
Fermi	0.5%
Hatch	1.2%
Hope Creek	0.5%
Millstone	1.2%
Monticello	1.2%
Nine Mile 1	1.5%
Peach Bottom	0.5%
Pilgrim	1.5%

Quad Cities	1.0%
Vermont Yankee	0.8%

The conservative L_a limit has led to difficulties in meeting the Integrated Leakage Rate Test (ILRT) limit of $(0.5)(.75) = 0.375$ percent by weight per day and has resulted in an accelerated ILRT frequency at Brunswick. The proposed amendment increases L_a from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig and L_t from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig. As demonstrated in the above table, the requested L_a and L_t limits are consistent with those established for other BWRs.

Chapter 15 of the Brunswick FSAR was reviewed and it was determined that Section 15.6.4, Loss of Coolant Accident, is affected by the proposed change. There are three analyses to be considered in this section: offsite doses, control room doses, and environmental qualification.

Offsite Doses

The limitations on primary containment leakage are intended to maintain the site boundary radiation doses within the limits specified in 10 CFR 100 during accident conditions. The original accident analysis for Brunswick was performed using assumptions derived by General Electric calculations and source term assumptions as specified by TID-14844, J. J. DiNunno, et. al, "Calculations of Distance Factors for Power and Test Reactor Sites," U. S. AEC, March 23, 1962. The assumptions used in this analysis, for the most part, are less conservative than those of Regulatory Guide 1.3, June 1977. Therefore, a new analysis, using the Regulatory Guide 1.3 assumptions, was performed to determine both the existing offsite doses and those which would result from the proposed change. The following are the results of this re-analysis.

Existing Doses for $L_a = 0.5\%$

	<u>Whole Body</u>	<u>Thyroid</u>
Site Boundary (0-2 hr)	5.61E-05 rem	7.76E-06 rem
LPZ (0-30 days)	2.00E-02 rem	1.17E-04 rem

Doses for $L_a = 0.5\%$ - Reg Guide 1.3 Assumptions

	<u>Whole Body</u>	<u>Thyroid</u>
Site Boundary (0-2 hr)	0.803 rem	3.92 rem
LPZ (0-30 days)	0.504 rem	10.1 rem

Doses for $L_a = 1.0\%$ - Reg Guide 1.3 Assumptions

	<u>Whole Body</u>	<u>Thyroid</u>
Site Boundary (0-2 hr)	1.61 rem	7.84 rem
LPZ (0-30 days)	1.01 rem	19.8 rem

10 CFR 100 Limits

	<u>Whole Body</u>	<u>Thyroid</u>
Site Boundary (0-2 hr)	25 rem	300 rem
LPZ (0-30 days)	25 rem	300 rem

As demonstrated in the above tables, raising the allowable containment leakage rates results in an increase in the offsite doses. However, both the site boundary and low population zone doses remain a small fraction of the limits specified in 10 CFR 100. These doses compare favorably with data available from selected plants referenced earlier.

<u>Plant</u>	<u>LPZ Dose Whole Body</u>	<u>LPZ Dose Thyroid</u>
Brunswick	1.01 rem	19.8 rem
Hatch*	3.0E-4 rem	1.7E-2 rem
Millstone	1.45 rem	55.6 rem
Pilgrim	1.7 rem	147 rem
Duane Arnold	2.86 rem	2.44 rem

* The analysis of offsite doses for Hatch did not use Regulatory Guide 1.3 methodology which results in the lower offsite doses.

Based on the above, Carolina Power & Light Company believes the calculated offsite doses resulting from the proposed increase in the allowable primary containment leakage rates L_a and L_t are acceptable and are well within the applicable limits of 10 CFR 100.

Control Room Doses

An increase in the allowable primary containment leakage can also affect the post-LOCA control room doses. The current 30 day control room doses for whole body, thyroid, and skin are 0.42 rem (8.4 percent of the 5 rem Standard Review Plan (SRP), NUREG-0800 limit), 0.41 rem (1.4 percent of the 30 rem SRP limit), and 0.039 rem (0.13 percent of the 30 rem SRP limit), respectively. Assuming the worst case, increasing L_a from 0.5 percent to 1.0 percent by weight per day and L_t from 0.357 percent to 0.714 percent by weight per day will raise these doses to no more than 0.84 rem whole body, 0.82 rem thyroid, and 0.08, skin. These dose limits remain only a small fraction of the limits specified in Section 6.4 of the Standard Review Plan. Based on the above, Carolina Power & Light Company believes the proposed increase in the allowable primary

containment leakage rates L_a and L_t is acceptable from a control room habitability standpoint.

Environmental Qualification

Finally, the effects of increasing the allowable primary containment leakage on environmental qualification were re-analyzed. Increasing L_a and L_t will decrease primary containment doses since it results in increased removal of activity from containment. It will, however, tend to increase the doses in the reactor building.

The equipment qualification doses in the reactor building were originally calculated for the Brunswick FSAR using the methodology of CP&L's Brunswick Plant calculation entitled Design Report 12. The re-analysis is more realistic and removes some of the conservatisms of the original analysis. It remains, however, a highly conservative analysis. The following table illustrates the differences in the original assumptions and those of the re-analysis.

Original FSAR Assumptions

5 iodine isotopes and
11 noble gas isotopes

1 average gamma ray energy
per isotope assuming 100%
yield

Shielding in air
considered for average
gamma ray energies

Absorbed dose calculated
for average gamma ray
energies

Material used for absorbed
dose calculation not
specified

Calculate dose at center
and edge of spheres using
integrated equations and
average gamma ray energies

No credit taken for
expansion of primary
containment leakage
into reactor building

New Assumptions

5 iodine isotopes and
13 noble gas isotopes

10 energy groups of
gamma ray emissions
for each isotope
including actual yield

Shielding in air
considered for each
energy group

Absorbed dose
calculated for each
energy group

Carbon used for
absorbed dose
calculation

Calculate dose at
center and edge of
spheres using CAD-CGGP
computer code and
Point-Kernel methods

In non-uniform case,
take credit for expansion
of primary containment
leakage in the

due to differing
temperature and pressure

reactor building com-
partment after leakage
due to much lower
temperature and pres-
sure in reactor
building compartment

For large and small
compartments, compartment
out flow equals primary
in-leakage. No credit
taken for removal by the
standby gas treatment system.
Non-Uniform Case only.

For small compartments,
out flow equals primary
containment
in-leakage

For large compartments,
take credit for 50% of
standby gas removal
capacity. Non-Uniform
Case only.

Note: Uniform - all Primary Leakage distributed throughout reactor
building (applies above 20 foot elevation).

Non-Uniform - all Primary Leakage into a compartment adjacent to
Primary (applies below 20 foot elevation).

The results of this re-analysis are summarized below.

<u>Analysis</u>	<u>Non-Uniform 8000 ft³ Compartment</u>	<u>Uniform 90 ft Radius Sphere</u>
Original	8.60E+06 rads	7.21E+04 rads
New L _a = 0.5%	1.40E+06 rads	2.34E+04 rads
New L _a = 1.0%	2.34E+06 rads	4.54E+04 rads

Based on the above, Carolina Power & Light Company has determined that the
bases for equipment qualification at Brunswick is not changed by increasing
the allowable primary containment leakage rates L_a and L_t.

ENCLOSURE 2

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

10 CFR 50.92 EVALUATION

The Commission has provided standards in 10 CFR 50.92(c) for determining whether a significant hazards consideration exists. A proposed amendment to an operating license for a facility involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any accident previously evaluated, or (3) involve a significant reduction in a margin of safety. Carolina Power & Light Company has reviewed this proposed license amendment request and determined that its adoption would not involve a significant hazards consideration. The bases for this determination are as follows:

Proposed Change

The proposed amendment increases the allowable primary containment leakage rates (L_a and L_t) specified in Technical Specification 3.6.1.2, Primary Containment Leakage. L_a is increased from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig. L_t is increased from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig.

Basis

The change does not involve a significant hazards consideration for the following reasons:

1. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed amendment does not involve any physical changes, additions, modifications, or deletions to existing equipment or systems. In addition, it does not affect any operating parameters of the reactor, primary coolant system, and emergency core cooling systems. Therefore, the proposed change does not affect core damage frequency or system availability. As such, the change can not involve an increase in the probability of a previously evaluated accident.

The proposed amendment increases L_a from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig and L_t from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig. Chapter 15 of the Brunswick FSAR was reviewed and it was

determined that Section 15.6.4, Loss of Coolant Accident, is affected by the proposed change. There are three analysis to be considered in this section: offsite doses, control room doses, and environmental qualification.

The proposed amendment will result in a slight increase to offsite doses resulting from a design basis LOCA; however, this increase is not significant. At the low population zone, the doses would increase from 2.0 percent to 4.0 percent of the 10 CFR 100 limit of 25 rem for the whole body and from 3.4 percent to 6.6 percent of the 10 CFR 100 limit of 300 rem for the thyroid. At the site boundary, the whole body and thyroid doses increase from 3.2 percent to 6.4 percent and 1.3 percent to 2.6 percent of the 10 CFR 100 limits respectively.

Assuming the worst case, increasing L_a from 0.5 percent to 1.0 percent by weight per day and L_t from 0.357 percent to 0.714 percent by weight per day will result in post-accident control room doses of no more than 0.84 rem whole body, 0.82 rem thyroid, and 0.08, skin. These dose limits remain only a small fraction of the limits specified in Section 6.4 of the Standard Review Plan (5 rem whole body, 30 rem thyroid, and 30 rem skin). As such, the proposed increase in the allowable primary containment leakage rates (L_a and L_t) is acceptable from a control room habitability standpoint.

Finally, the effects of increasing the allowable primary containment leakage on environmental qualification were re-analyzed. Increasing L_a and L_t will decrease primary containment doses since it results in increased removal of activity from containment. It will, however, tend to increase the doses in the reactor building.

The equipment qualification doses in the reactor building were originally calculated for the Brunswick PSAR using the methodology of CP&L's Brunswick calculation entitled Design Report 12. The re-analysis is more realistic and removes some of the conservatism of the original analysis. It remains, however, a highly conservative analysis. This analysis determined that environmental qualification doses will remain within those currently specified. As such, the bases for equipment qualification at Brunswick is not changed by increasing the allowable primary containment leakage rates.

Based on the above, the Company has concluded that the proposed amendment will not result in a significant increase in the consequences of a previously evaluated accident.

2. The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated. As stated above, the proposed amendment does not involve any physical changes, additions, modifications, or deletions to existing equipment or systems. In addition, it does not affect any operating parameters of the reactor, reactor coolant system, and emergency core cooling systems.

Therefore, the proposed amendment cannot create the possibility of a new or different kind of accident.

3. The proposed amendment does not involve a significant reduction in the margin of safety. The change does not affect the method by which any safety related equipment or systems perform their intended function. Nor is any safety related setpoint revised as a result of the change. Increasing L_a and L_t will result in a slight increase to offsite doses resulting from a design basis LOCA. However, the doses remain well within 10 CFR 100 limits and, therefore, are not considered to be significant. Control room doses are also increased but remain well below the applicable limits specified in Section 6.4 of the Standard Review Plan. As such, the proposed increase in the allowable primary containment leakage rates (L_a and L_t) is acceptable from a control room habitability standpoint. Finally, the effects of increasing the allowable primary containment leakage rates on environmental qualification were re-analyzed. It was determined that the bases for equipment qualification at Brunswick is not changed by increasing the allowable leakage rates.

Based on the above, the Company has concluded that the proposed amendment will not result in a significant reduction in the margin of safety.

ENCLOSURE 3

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

ENVIRONMENTAL CONSIDERATION

10 CFR 51.22(c)(9) provides criterion for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and (3) result in a significant increase in individual or cumulative occupational radiation exposure. Carolina Power & Light Company has reviewed this request and determined that the proposed amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the amendment. The basis for this determination follows:

Proposed Change

The proposed amendment increases the allowable primary containment leakage rates (L_a and L_t) specified in Technical Specification 3.6.1.2, Primary Containment Leakage. L_a is increased from 0.5 percent to 1.0 percent by weight of the containment air per 24 hours at 49 psig. L_t is increased from 0.357 percent to 0.714 percent by weight of containment air per 24 hours at 25 psig.

Basis

The change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

1. As demonstrated in Enclosure 2, the proposed amendment does not involve a significant hazards consideration.
2. The proposed amendment does not result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. The proposed amendment will result in a slight increase to offsite doses resulting from a design basis LOCA; however, this increase is not significant. At the low population zone, the doses would increase from 2.0 percent to 4.0 percent of the 10 CFR 100 limit of 25 rem for the whole body and from 3.4 percent to 6.6 percent of the 10 CFR 100 limit of 300 rem for the thyroid. At the site boundary, the whole body and thyroid doses increase from 3.2 percent to 6.4 percent

and 1.3 percent to 2.6 percent of the 10 CFR 100 limits respectively. Since the resulting offsite doses remain only a very small fraction of the 10 CFR 100 limits, this change does not result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite.

3. The proposed amendment does not result in a significant increase in individual or cumulative occupational radiation exposure. Assuming the worst case, increasing L_a from 0.5 percent to 1.0 percent by weight per day and L_t from 0.357 percent to 0.714 percent by weight per day will result in post-accident control room doses of no more than 0.84 rem whole body, 0.82 rem thyroid, and 0.08, skin. These dose limits remain only a small fraction of the limits specified in Section 6.4 of the Standard Review Plan (5 rem whole body, 30 rem thyroid, and 30 rem skin). As such, this change does not result in a significant increase in individual or cumulative occupational radiation exposure.

ENCLOSURE 4

ERUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

INSTRUCTIONS FOR INCORPORATION

The proposed changes to the Technical Specifications (Appendix A to Operating Licenses DPR-71 and DPR-62) would be incorporated as follows:

Unit 1

Remove Page

3/4 6-2

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Unit 2

Remove Page

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B 3/4 6-1

B 3/4 6-2

Insert Page

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B 3/4 6-1

B 3/4 6-2

ENCLOSURE 5

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
NRC DOCKETS 50-325 & 50-324
OPERATING LICENSES DPR-71 & DPR-62
REQUEST FOR LICENSE AMENDMENT
INCREASED CONTAINMENT LEAKAGE RATE

SUMMARY LIST OF REVISIONS

Unit 1

<u>Pages</u>	<u>Description of Changes</u>
3/4 6-2	Revised the value of L_a from 0.5 percent to 1.0 percent. Revised the values of L_t from 0.357 percent to 0.714 percent.
B 3/4 6-1	Included discussion regarding L_a and L_t allowable leakage rates.
B 3/4 6-2	Material relocated from previous page.

Unit 2

<u>Pages</u>	<u>Description of Changes</u>
3/4 6-2	Revised the value of L_a from 0.5 percent to 1.0 percent. Revised the values of L_t from 0.357 percent to 0.714 percent.
B 3/4 6-1	Included discussion regarding L_a and L_t allowable leakage rates.
B 3/4 6-2	Material relocated from previous page.