VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 23, 2004

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| U.S. Nuclear Regulatory Commission | Serial No. 03-585 |
| Attention: Document Control Desk | NAPS/GSS R0 |
| Washington, D.C. 20555 | Docket Nos. 50-338/339 |
| | License Nos. NPF-4/-7 |

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)**
**NORTH ANNA POWER STATION UNITS 1 AND 2**
**TECHNICAL SPECIFICATION BASES CHANGES**

Pursuant to the Technical Specifications Bases Control Program, Virginia Electric and Power Company (Dominion) hereby submits changes to the Bases to the Technical Specifications for your information consistent with 10 CFR 50.71(e). Changes provide clarification to the various Bases sections associated with the RCS Leakage Detection Instrumentation, Service Water System, Main Control Room/Emergency Switchgear Room Air Conditioning System, and Diesel Fuel Oil Testing Program.

The Technical Specifications Bases changes have been reviewed and approved by the Station Nuclear Safety and Operating Committee. It has been determined that these changes do not require a change to the Technical Specifications or operating license, or involve a change to the UFSAR or Bases that require NRC prior approval pursuant to 10 CFR 50.59. A summary of the changes and the revised Technical Specifications Bases pages are being provided in Attachments 1 and 2, respectively. These changes have been incorporated into the Technical Specifications Bases.

If you have any further questions, please contact us.

Very truly yours,

L. N. Hartz
Vice President – Nuclear Engineering

Attachments
1. Summary of Changes
2. Technical Specification Bases Changes

Commitments made in this letter: None

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ATTACHMENT 1

SUMMARY OF CHANGES

Virginia Electric and Power Company
(Dominion)
North Anna Power Station Units 1 and 2

## Summary of Changes

**RCS Leakage Detection Instrumentation - Clarification of Containment Sump Monitor Requirements (BASES: Background for B 3.4.15)**

The purpose of the change was to clarify equipment that can be taken credit for in order to meet RCS Leakage Detection Instrumentation requirements of Technical Specifications and Criterion 1 of 10CFR50.36(c)(2)(ii).

**Service Water System (Bases: Actions and LCO for B 3.7.8)**

Changes will clarify the Bases to allow the changing of the designation of the three operable service water pumps during the seven day completion time, to provide guidance on when to apply each action statement, and adds a note to allow the same train designators when the service water pumps are operable and the system is throttled. Changes will also clarify that a service water loop can be considered operable with two arrays operable provided that the supply valves are secured in the accident position with power removed from the valve operators.

**Impact of a High Energy Line Break on the Main Control Room/Emergency Switchgear Room Air Conditioning System (Bases: Applicable Safety Analyses for B 3.7.11)**

The purpose of the change is to provide a consistent description of the existing design basis condition regarding the potential for a high-energy line break in the turbine building and its associated impact on the Main Control Room/Emergency Switchgear Room Air Conditioning System.

**Diesel Fuel Oil Testing Program - Deletion of Reference to ASTM D4176-86 (Bases: Reference for B 3.8.3)**

The purpose of the change is to correct an exception made to the proposed fuel oil testing program specified in NUREG-1431. The reference to ASTM D4176-86 should have been deleted when the Technical Specifications Bases was modified to be plant specific during the development of the Improved Technical Specifications.

# ATTACHMENT 2

# TECHNICAL SPECIFICATION BASES CHANGES

Virginia Electric and Power Company
(Dominion)
North Anna Power Station Units 1 and 2

## B 3.4 REACTOR COOLANT SYSTEM (RCS)

## B 3.4.15 RCS Leakage Detection Instrumentation

BASES

BACKGROUND

UFSAR, Chapter 3 (Ref. 1) requires compliance with Regulatory Guide 1.45. Regulatory Guide 1.45 (Ref. 2) describes acceptable methods for selecting RCS leakage detection systems.

Leakage detection systems must have the capability to detect significant reactor coolant pressure boundary (RCPB) degradation as soon after occurrence as practical to minimize the potential for propagation to a gross failure. Thus, an early indication or warning signal in the control room is necessary to permit proper evaluation of all unidentified LEAKAGE.

Industry practice has shown that water flow changes of 0.5 to 1.0 gpm can be readily detected in contained volumes by monitoring changes in water level, in flow rate, or in the operating frequency of a pump. The containment sump used to collect unidentified LEAKAGE includes two sump level monitors that provide level indication. The "A" train level indicator provides input to a calculated discharge flow rate determined by the plant computer. Either level indication or the calculated containment sump discharge flow rate is acceptable for detecting increases in unidentified LEAKAGE.

The reactor coolant contains radioactivity that, when released to the containment, can be detected by radiation monitoring instrumentation. Reactor coolant radioactivity levels will be low during initial reactor startup and for a few weeks thereafter, until activated corrosion products have been formed and fission products appear from fuel element cladding contamination or cladding defects. Instrument sensitivities in accordance with Regulatory Guide 1.45 (Ref. 2) particulate and for gaseous monitoring are practical for these leakage detection systems. Radioactivity detection systems are included for monitoring both particulate and gaseous activities because of their sensitivities and rapid responses to RCS LEAKAGE. One Containment Air Recirculation Fan (CARF) provides enough air flow for the operation of the radiation detectors.

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BASES

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| BACKGROUND (continued) | Air temperature and pressure monitoring methods may also be used to infer unidentified LEAKAGE to the containment. Containment temperature and pressure fluctuate slightly during unit operation, but a rise above the normally indicated range of values may indicate RCS leakage into the containment. The relevance of temperature and pressure measurements are affected by containment free volume and, for temperature, detector location. Alarm signals from these instruments can be valuable in recognizing rapid and sizable leakage to the containment. Temperature and pressure monitors are not required by this LCO. |
| APPLICABLE SAFETY ANALYSES | The need to evaluate the severity of an alarm or an indication is important to the operators, and the ability to compare and verify with indications from other systems is necessary. Multiple instrument locations are utilized, if needed, to ensure that the transport delay time of the leakage from its source to an instrument location yields an acceptable overall response time.<br><br>The safety significance of RCS LEAKAGE varies widely depending on its source, rate, and duration. Therefore, detecting and monitoring RCS LEAKAGE into the containment area is necessary. Quickly separating the identified LEAKAGE from the unidentified LEAKAGE provides quantitative information to the operators, allowing them to take corrective action should a leakage occur detrimental to the safety of the unit and the public.<br><br>RCS leakage detection instrumentation satisfies Criterion 1 of 10 CFR 50.36(c)(2)(ii). |
| LCO | One method of protecting against large RCS leakage derives from the ability of instruments to rapidly detect extremely small leaks. This LCO requires instruments of diverse monitoring principles to be OPERABLE to provide a high degree of confidence that extremely small leaks are detected in time to allow actions to place the unit in a safe condition, when RCS LEAKAGE indicates possible RCPB degradation.<br><br>The LCO is satisfied when monitors of diverse measurement means are available. Thus, the containment sump monitor, in combination with a gaseous or particulate radioactivity monitor, provides an acceptable minimum. |

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a COT every 92 days on the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Frequency is based on the staff recommendation for increasing the availability of radiation monitors according to NUREG-1366 (Ref. 3).

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The frequency of 18 months is a typical refueling cycle and considers channel reliability. Again, operating experience has proven that this Frequency is acceptable.

REFERENCES

1. UFSAR, Chapter 3.
2. Regulatory Guide 1.45, dated May, 1973.
3. NUREG-1366, dated December, 1992.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The SW System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two SW loops are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming that the worst case single active failure occurs coincident with the loss of offsite power.

A SW loop is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. Either

a.1 Two SW pumps are OPERABLE in an OPERABLE flow path; or

a.2 One SW pump is OPERABLE in an OPERABLE flow path provided two SW pumps are OPERABLE in the other loop and SW flow to the CC heat exchangers is throttled; and

b. Either

b.1 Three spray arrays are OPERABLE in an OPERABLE flow path; or

b.2 Two spray arrays are OPERABLE in an OPERABLE flow path, provided two spray arrays are OPERABLE in the other loop; and the spray valves for the required OPERABLE spray arrays in both loops are secured in the accident position and power removed from the valve operators; and

c. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

For two SW loops to be considered OPERABLE during MODES 1, 2, 3, and 4, the following conditions must also be met in order to provide protection for a single active failure of the actuation circuitry:

(continued)

BASES

LCO (continued)

Note: If three or more SW pumps are OPERABLE and the SW System is throttled, SW pumps may be operated with the same train designations.

a. With one SW pump operating on each SW loop, the operating pumps have opposite train designations; and

b. With one of the four spray arrays on each SW loop inoperable in accordance with b.1 above, the inoperable spray arrays have opposite train designations.

A required valve directing flow to a spray array, bypass line, or other component is considered OPERABLE if it is capable of automatically moving to its safety position or if it is administratively placed in its safety position.

APPLICABILITY

In MODES 1, 2, 3, and 4, the SW System is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SW System and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the SW System are determined by the systems it supports.

ACTIONS

A.1

If one SW System loop is inoperable due to an inoperable SW pump, the flow resistance of the system must be adjusted within 72 hours by throttling component cooling water heat exchanger flows to ensure that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

B.1 and B.2

If one or more SW System loops are inoperable due to only two SW pumps being OPERABLE, the flow resistance of the system must be adjusted within one hour to ensure that design flows to the RS System heat exchangers are achieved if no additional failures occur following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. Two SW pumps aligned to one

(continued)

BASES

ACTIONS

B.1 and B.2 (continued)

loop or one SW pump aligned to each loop is capable of performing the safety function if CC heat exchanger flow is properly throttled. However, overall reliability is reduced because a single failure disabling a SW pump could result in loss of the SW System function. The one hour time reflects the need to minimize the time that two pumps are inoperable and CC heat exchanger flow is not properly throttled, but is a reasonable time based on the low probability of a DBA occurring during this time period. Restoring one SW pump to OPERABLE status within 72 hours together with the throttling ensures that design flows to the RS System heat exchangers are achieved following an accident. The required resistance is obtained by throttling SW flow through the CC heat exchangers. In this configuration, a single failure disabling a SW pump would not result in loss of the SW System function.

C.1

If one SW loop is inoperable for reasons other than Condition A, action must be taken to restore the loop to OPERABLE status.

In this Condition, the remaining OPERABLE SW loop is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SW loop could result in loss of SW System function. The inoperable SW loop is required to be restored to OPERABLE status within 72 hours unless the criteria for a 7 day Completion Time are met, as stated in the 72 hour Completion Time Note. The 7 day Completion Time applies if the three criteria in the 7 day Completion Time Note are met.

The first criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if the inoperability of one SW loop is part of SW System upgrades. Service Water System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of SW System piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspection of and repairs to buried piping interior coatings and pump or valve house components. The second criterion in the 7 day Completion Time Note states that the 7 day Completion Time is

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BASES

ACTIONS

C.1 (continued)

only applicable if three SW pumps are OPERABLE from initial Condition entry, including one SW pump being allowed to not have automatic start capability. The third criterion in the 7 day Completion Time Note states that the 7 day Completion Time is only applicable if two auxiliary SW pumps are OPERABLE from initial Condition entry. The 72 hour and 7 day Completion Times are both based on the redundant capabilities afforded by the OPERABLE loop, and the low probability of a DBA occurring during this time period. The 7 day Completion Time also credits the redundant capabilities afforded by three OPERABLE SW pumps (one without automatic start capability) and two OPERABLE auxiliary SW pumps. Changing the designation of the three OPERABLE SW pumps during the 7 day Completion Time is allowed.

D.1 and D.2

If the SW pumps or loop cannot be restored to OPERABLE status within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

E.1 and E.2

If two SW loops are inoperable for reasons other than only two SW pumps being OPERABLE, the SW System cannot perform the safety function. With two SW loops inoperable, the CC System and, consequently, the Residual Heat Removal (RHR) System have no heat sink and are inoperable. Twelve hours is allowed to enter MODE 4, in which the Steam Generators can be used for decay heat removal to maintain reactor temperature. Twelve hours is reasonable, based on operating experience, to reach MODE 4 from full power conditions in an orderly manner and without challenging unit systems. The unit may then remain in MODE 4 until a method to further cool the units becomes available, but actions to determine a method and cool the unit to a condition outside of the Applicability

(continued)

BASES

ACTIONS

E.1 and E.2 (continued)

must be initiated within one hour and continued in a reasonable manner and without delay until the unit is brought to MODE 5.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR is modified by a Note indicating that the isolation of the SW System components or systems may render those components inoperable, but does not affect the OPERABILITY of the SW System.

Verifying the correct alignment for manual, power operated, and automatic valves in the SW System flow path provides assurance that the proper flow paths exist for SW System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves. The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the SW System valves on an actual or simulated actuation signal. The SW System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.3

This SR verifies proper automatic operation of the SW pumps on an actual or simulated actuation signal. The SW System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. UFSAR, Section 9.2.1.

2. UFSAR, Section 6.2.2.

3. UFSAR, Section 5.5.4.

# B 3.7 PLANT SYSTEMS

## B 3.7.11 Main Control Room/Emergency Switchgear Room (MCR/ESGR) Air Conditioning System (ACS)

BASES

BACKGROUND

The MCR/ESGR ACS provides cooling for the MCR/ESGR envelope following isolation of the MCR/ESGR envelope. The MCR/ESGR ACS also provides cooling for the MCR/ESGR envelope during routine unit operation.

The MCR/ESGR ACS consists of two independent and redundant subsystems that provide cooling of MCR/ESGR envelope air. Each subsystem consists of two air handling units (one for the MCR and one for the ESGR), one chiller in one subsystem and two chillers in the other, valves, piping, instrumentation, and controls to provide for MCR/ESGR envelope cooling. One subsystem has one chiller, the other has two chillers, either of which can be used by that subsystem, but which are not electrically independent from each other.

The MCR/ESGR ACS is an emergency system, parts of which may also operate during normal unit operations. A single subsystem will provide the required cooling to maintain the MCR/ESGR envelope within design limits. The MCR/ESGR ACS operation in maintaining the MCR/ESGR envelope temperature is discussed in the UFSAR, Section 9.4 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the MCR/ESGR ACS is to maintain the MCR/ESGR envelope temperature within limits for 30 days of continuous occupancy after a DBA.

The MCR/ESGR ACS components are arranged in redundant, safety related subsystems. During emergency operation, the MCR/ESGR ACS maintains the temperature within design limits. A single active failure of a component of the MCR/ESGR ACS, with a loss of offsite power, does not impair the ability of the system to perform its design function. A postulated high energy line break (HELB) in the Turbine Building is assumed to render the affected unit's main control room chillers inoperable since the chillers are not qualified for the harsh environment inside the accident unit's Chiller Room. The equipment qualification (EQ) design basis for maintaining a habitable environment in the Control Room is

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BASES

APPLICABLE SAFETY ANALYSES (continued)

based on the backup function of the operable unaffected unit's Chiller System (Ref. 2). The MCR/ESGR ACS is designed in accordance with Seismic Category I requirements. The MCR/ESGR ACS is capable of removing sensible and latent heat loads from the MCR/ESGR envelope, which include consideration of equipment heat loads and personnel occupancy requirements, to ensure equipment OPERABILITY.

The MCR/ESGR ACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Two independent and redundant subsystems of the MCR/ESGR ACS, providing cooling to the unit ESGR and associated portion of the MCR, are required to be OPERABLE to ensure that at least one is available, assuming a single failure disabling the other subsystem. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

The MCR/ESGR ACS is considered to be OPERABLE when the individual components necessary to cool the MCR/ESGR envelope air are OPERABLE in both required subsystems. Each subsystem consists of two air handling units (one for the MCR and one for the ESGR), one chiller, valves, piping, instrumentation and controls. The two subsystems provide air temperature cooling to the portion of the MCR/ESGR envelope associated with the unit. In addition, an OPERABLE MCR/ESGR ACS must be capable of maintaining air circulation. An MCR/ESGR ACS subsystem does not have to be in operation to be considered OPERABLE. The MCR/ESGR ACS is considered OPERABLE when it is capable of being started by manual actions within 10 minutes. The time of 10 minutes is based on the time required to start the system manually following required testing.

APPLICABILITY

In MODES 1, 2, 3, and 4, and during movement of recently irradiated fuel assemblies, the MCR/ESGR ACS must be OPERABLE to ensure that the MCR/ESGR envelope temperature will not exceed equipment operational requirements following isolation of the MCR/ESGR envelope. The MCR/ESGR ACS is only required to be OPERABLE during fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within a time frame established by analysis. The term recently is defined as all irradiated fuel assemblies, until analysis is performed to determine a specific time), due to radioactive decay.

BASES

ACTIONS

A.1

With one or more required MCR/ESGR ACS subsystem inoperable, and at least 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE MCR/ESGR ACS subsystem is adequate to maintain the MCR/ESGR envelope temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE MCR/ESGR ACS subsystem could result in loss of MCR/ESGR ACS function. The 30 day Completion Time is based on the low probability of an event requiring MCR/ESGR envelope isolation, the consideration that the remaining subsystem can provide the required protection, and that alternate safety or nonsafety related cooling means are available.

The LCO requires the OPERABILITY of a number of independent components. Due to the redundancy of subsystems and the diversity of components, the inoperability of one active component in a subsystem does not render the MCR/ESGR ACS incapable of performing its function. Neither does the inoperability of two different components, each in a different subsystem, necessarily result in a loss of function for the MCR/ESGR ACS (e.g., an inoperable chiller in one subsystem, and an inoperable air handler in the other). This allows increased flexibility in unit operations under circumstances when components in opposite subsystems are inoperable.

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable MCR/ESGR ACS subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

During movement of recently irradiated fuel, if the required inoperable MCR/ESGR ACS subsystems cannot be restored to OPERABLE status within the required Completion Time, the

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BASES

ACTIONS

C.1 and C.2 (continued)

OPERABLE MCR/ESGR ACS subsystem must be placed in operation immediately. This action ensures that the remaining subsystem is OPERABLE and that active failures will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1

During movement of recently irradiated fuel assemblies, with less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the MCR/ESGR envelope. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

With less than 100% of the MCR/ESGR ACS cooling equivalent to a single OPERABLE MCR/ESGR ACS subsystem available in MODE 1, 2, 3, or 4, the MCR/ESGR ACS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that the heat removal capability of any one of the three chillers for the unit is sufficient to remove the heat load assumed in the safety analyses in the MCR/ESGR envelope. This SR consists of a combination of testing and calculations. The 18 month on a STAGGERED TEST BASIS Frequency is appropriate since significant degradation of the MCR/ESGR ACS is slow and is not expected over this time period.

BASES

REFERENCES

1. UFSAR, Section 9.4.

2. Technical Report No. EQ-0068, Rev. 1, "Review of EQ Applicability of Control Room Chillers and Associated Equipment."

BASES

REFERENCES (continued)

6. ASTM Standards: D4057-88; D975-89; D1552-88; D2622-82; D2276, Method A; D4294-98.

7. ASTM Standards, D975, Table 1, 1989.