

**1.6 Material Referenced**

The AP600 Design Control Document references various Westinghouse technical support documents; these documents are listed by DCD section in Table 1.6-1 (Sheets 1 through 18).

Table 1.6-1 (Sheet 1 of 19)

**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title  |
|--------------------------|---------------------------------------|--|
| 1.5                      | WCAP-14217 (P)<br>WCAP-14218          | Core Makeup Tank Final Data Report, November 1994  |
|                          | WCAP-13286 (P)<br>WCAP-13287          | AP600 Passive Core Cooling System Check Valve Test<br>Final Report, April 1992   |
|                          | WCAP-13891 (P)<br>WCAP-14095          | AP600 Automatic Depressurization System Phase A Test<br>Data Report, May 1994  |
|                          | WCAP-14324 (P)<br>WCAP-14325          | Final Data Report for ADS Phase B1 Tests, April 1995   |
|                          | WCAP-14134 (P)<br>WCAP-14137          | AP600 Passive Containment Cooling System Integral<br>Small-Scale Tests Final Report, August 1994                               |
|                          | WCAP-13566 (P)<br>WCAP-13567          | AP600 1/8th Large Scale Passive Containment Cooling<br>System Heat Transfer Baseline Data Report, Revision 1,<br>December 1992 |
|                          | WCAP-14135 (P)<br>WCAP-14138          | Final Test Report for PCS Large Scale Phase 2 and<br>Phase 3 Tests, Revision 3, November 1998                                  |
|                          | WCAP-13353 (P)<br>WCAP-13354          | Passive Containment Cooling System Water Distribution<br>Phase 1 Test Data Report, April 1992                                  |
|                          | WCAP-13296 (P)<br>WCAP-13297          | PCS Water Distribution Test Phase II Test Data Report,<br>March 1992   |
|                          | WCAP-13960 (P)<br>WCAP-13961          | PCS Water Distribution Phase 3 Test Data Report,<br>December 1993  |
|                          | WCAP-13294 (P)<br>WCAP-13295          | Phase I Wind Tunnel Testing for the Westinghouse<br>AP600 Reactor, April 1992  |
|                          | WCAP-13323 (P)<br>WCAP-13324          | Phase II Wind Tunnel Testing for the Westinghouse<br>AP600 Reactor, August 1992  |
|                          | WCAP-14068 (P)<br>WCAP-14084          | Phase IV Wind Tunnel Testing for the Westinghouse<br>AP600 Reactor, May 1994   |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title   |
|--------------------------|---------------------------------------|---|
| 1.5                      | WCAP-14169 (P)<br>WCAP-14170          | Phase IVa Wind Tunnel Testing for the Westinghouse AP600 Reactor, Supplemental Report, September 1994           |
|                          | WCAP-14091 (P)<br>WCAP-14092          | Phase IVb Wind Tunnel Testing for the Westinghouse AP600 Reactor, July 1994                                     |
|                          | WCAP-12980 (P)<br>WCAP-13573          | AP600 Passive Residual Heat Removal Heat Exchanger Test Final Report, Revision 3, April 1997                    |
|                          | WCAP-14371 (P)<br>WCAP-14372          | AP600 Low Flow Critical Heat Flux (CHF) Test Data Analysis, May 1995  |
|                          | WCAP-14252 (P)<br>WCAP-14253          | AP600 Low Pressure 1/4 Height Integral Systems Tests - Final Data Report, Revision 1, November 1998             |
|                          | WCAP-14309 (P)<br>WCAP-14310          | AP600 Design Certification Program, SPES-2 Tests Final Data Report, Revision 2, May 1997                        |
|                          | WCAP-12648 (P)<br>WCAP-13322          | AP600 Incore Instrumentation System Electromagnetic Interference Test Report, Revision 1, April 1992            |
|                          | WCAP-13298 (P)<br>WCAP-13299          | RCP Air Model Test Report, August 1991  |
|                          | WCAP-12668 (P)<br>WCAP-13321          | AP600 High Inertia Rotor Testing - Phase I, Test Report, March 1990   |
|                          | WCAP-13319 (P)<br>WCAP-13320          | AP600 High Inertia Rotor Testing - Phase 2 Report, August 1991  |
| 1.9                      | WCAP-13758 (P)<br>WCAP-13759          | High Inertia Rotor Test - Phase 3 Report, June 1993   |
|                          | WCAP-13856                            | AP600 Implementation of the Regulatory Treatment of Nonsafety-Related Systems Process, Revision 1, January 1998 |
|                          | WCAP-14425                            | Evaluation of the AP600 Conformance to Inter-System Loss-of-Coolant Accident Acceptance Criteria, July 1995     |
|                          | WCAP-13054                            | AP600 Compliance with SRP Acceptance Criteria, Revision 3, March 1998   |
|                          | WCAP-13559                            | Operational Assessment for AP600, Revision 2, March 1998  |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title  |
|--------------------------|---------------------------------------|--|
| 1.A                      | WCAP-8324-A                           | Control of Delta Ferrite in Austenitic Stainless Steel Weldments, June 1974  |
|                          | WCAP-8693                             | Delta Ferrite in Production Austenitic Stainless Steel Weldments, January 1976   |
|                          | WCAP-8577                             | The Application of Pre-Heat Temperature After Welding of Pressure Vessel Steels, September 1975  |
|                          | WCAP-8218                             | Fuel Densification Experimental Results and Model for Reactor Applications, March 1975   |
| 3.3                      | WCAP-13323 (P)<br>WCAP-13324          | Phase II Wind Tunnel Testing for the Westinghouse AP600 Reactor, August 1992   |
|                          | WCAP-14068 (P)<br>WCAP-14084          | Phase IVA Wind Tunnel Testing for the Westinghouse AP600 Reactor, May 1994   |
|                          | WCAP-14169 (P)<br>WCAP-14170          | Phase IVA Wind Tunnel Testing for the Westinghouse AP600 Reactor, Supplemental Report, September 1994  |
| 3.5                      | WCAP-13856                            | AP600 Implementation of the Regulatory Treatment of Nonsafety-Related Systems Process, Revision 1, January 1998  |
| 3.6                      | WCAP-8077                             | Ice Condenser Containment Pressure Transient Analysis Methods, March 1977  |
|                          | WCAP-8708 (P)<br>WCAP-8709-A          | MULTIFLEX A FORTRAN-IV Computer Program for Analyzing Thermal-Hydraulic-Structure System Dynamics, February 1976   |
|                          | WCAP-8252                             | Documentation of Selected Westinghouse Structural Analysis Computer Codes, Revision 1, May 1977  |
| 3.7                      | WCAP 7921-AR                          | Damping Values of Nuclear Power Plant Components, May 1974   |
|                          | WCAP-9903                             | Justification of the Westinghouse Equivalent Static Analysis Method for Seismic Qualification of Nuclear Power Plant Auxiliary Mechanical Equipment, August 1980 |

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Table 1.6-1 (Sheet 4 of 19)

**MATERIAL REFERENCED**

| <b>DCD<br/>Section<br/>Number</b> | <b>Westinghouse Topical<br/>Report Number</b>   | <b>Title</b>   |
|-----------------------------------|---|--|
| 3.8                               | WCAP-13891  | AP600 Automatic Depressurization System Phase A Test Data Report, May 1994   |
|                                   | WCAP-14324  | Final Data Report for ADS Phase B1 Tests, April 1995   |
| 3.9                               | WCAP-7765-AR  | Westinghouse PWR Internals Vibrations Summary Three-Loop Internals Assurance, November 1973                            |
|                                   | WCAP-8766 (P)<br>WCAP-8780  | Verification of Neutron Pad and 17x17 Guide Tube Designs by Preoperational Tests on the Trojan 1 Power Plant, May 1976 |
|                                   | WCAP-8516-P (P)<br>WCAP-8517  | UHI Plant Internals Vibrations Measurement Program and Pre- and Post-Hot Functional Examinations, March 1975           |
|                                   | WCAP-10846 (P)  | Doel 4 Reactor Internals Flow-Induced Vibration Measurement Program, March 1985  |
|                                   | WCAP-10865 (P)<br>WCAP-10866  | South Texas Plant (TGX) Reactor Internals Flow-Induced Vibration Assessment, February 1985                             |
|                                   | WCAP-8708-P-A (P)<br>Volumes 1 and 2<br>WCAP-8709-A<br>Volumes 1 and 2                                      | MULTIFLEX A FORTRAN-IV Computer Program for Analyzing Thermal-Hydraulic-Structure System Dynamics, February 1976       |
|                                   | WCAP-8446 (P)<br>WCAP-8449  | 17x17 Drive Line Components Tests - Phase 1B 11, 111 D-Loop Drop and Deflection, December 1974                         |
|                                   | WCAP-13856  | AP600 Implementation of Regulatory Treatment of Nonsafety-Related Systems Process, Revision 1, January 1998            |
|                                   | WCAP-9693 (P)   | Investigation of Feedwater Line Cracking in Pressurized Water Reactor Plants, June 1980                                |
|                                   | WCAP-14761  | AP600 Reactor Internals Flow-Induced Vibration Assessment Program, March 1996  |
| WCAP-8236(P)<br>WCAP-8238         | Safety Analysis of the 17x17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident, December 1973 |  |

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Table 1.6-1 (Sheet 5 of 19)

**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number    | Title   |
|--------------------|---------------------------------------|---|
| 4.1                | WCAP-10444-A (P)<br>WCAP-10445-NP-A   | VANTAGE 5H Fuel Assembly, Addendum 2A, February 1989  |
|                    | WCAP-12610-P-A (P)<br>WCAP-14342-P-A  | VANTAGE+ Fuel Assembly Reference Core Report, April 1995  |
|                    | [WCAP-12488-A (P)<br>[WCAP-14204-A]*  | <i>Fuel Criteria Evaluation Process, October 1994]*</i>   |
| 4.2                | [WCAP-12488-A (P)<br>[WCAP-14204-A]*  | <i>Fuel Criteria Evaluation Process, October 1994]*</i>   |
|                    | WCAP-10125-P-A (P)<br>WCAP-10126-NP-A | Extended Burnup Evaluation of Westinghouse Fuel, December 1985  |
|                    | WCAP-8183                             | Operational Experience with Westinghouse Cores (Revised Annually)   |
|                    | WCAP-9179 (P)<br>WCAP-9224            | Properties of Fuel and Core Component Materials, July 1978  |
|                    | WCAP-12610-P-A (P)<br>WCAP-14342-A    | VANTAGE+ Fuel Assembly Reference Core Report, April 1995  |
|                    | WCAP-8218-P-A (P)<br>WCAP-8219-A      | Fuel Densification Experimental Results and Model for Reactor Application, March 1975                                   |
|                    | WCAP-10851-P-A (P)<br>WCAP-11873-A    | Improved Fuel Performance Models for Westinghouse Fuel Rod Design and Safety Evaluations, August 1988                   |
|                    | WCAP-13589-A (P)<br>WCAP-14297-A      | Assessment of Clad Flattening and Densification Power Spike Factor Elimination in Westinghouse Nuclear Fuel, March 1995 |
|                    | WCAP-8963-P-A (P)<br>WCAP-8964-A      | Safety Analysis for the Revised Fuel Rod Internal Pressure Design Basis, August 1977                                    |
|                    | WCAP-10021-P-A (P)<br>WCAP-10377-NP-A | Westinghouse Wet Annular Burnable Absorber Evaluation Report, Revision 1, October 1983                                  |
|                    | WCAP-10444-P-A (P)<br>WCAP-10445-NP-A | Reference Core Report VANTAGE 5 Fuel Assembly, September 1985   |
|                    | WCAP-8278 (P)<br>WCAP-8279            | Hydraulic Flow Test of the 17x17 Fuel Assembly, February 1974   |

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**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number    | Title   |
|--------------------|---------------------------------------|---|
| 4.2                | WCAP-8691                             | Fuel Rod Bow Evaluation, Revision 1, July 1979  |
|                    | WCAP-9500-P-A (P)<br>WCAP-9500-A      | Reference Core Report 17x17 Optimized Fuel Assembly, May 1982   |
|                    | WCAP-8236 (P)<br>WCAP-8288            | Safety Analysis of the 17x17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident, December 1973           |
|                    | WCAP-9401-P-A (P)<br>WCAP-9402-A      | Verification, Testing, and Analysis of the 17x17 Optimized Fuel Assembly, August 1981                                 |
|                    | WCAP-9283                             | Integrity of Primary Piping Systems of Westinghouse Nuclear Power Plants During Postulated Seismic Events, March 1978 |
| 4.3                | WCAP-9272-P-A                         | Westinghouse Reload Safety Evaluation Methodology, July 1985  |
|                    | [WCAP-12488-P-A (P)<br>WCAP-14204-A]* | <i>Fuel Criteria Evaluation Process, October 1994</i> *   |
|                    | WCAP-12472-P-A (P)<br>WCAP-12473-P-A  | BEACON: Core Monitoring and Operations Support System, August 1994 and Addendum 1, May 1996                           |
|                    | WCAP-8330                             | Westinghouse Anticipated Transients Without Reactor Trip Analysis, August 1974  |
|                    | WCAP-11992                            | Joint Westinghouse Owners Group/Westinghouse Program: ATWS Rule Administration Process, December 1988                 |
|                    | WCAP-7308-L-P-A (P)<br>WCAP-7308-L-A  | Evaluation of Nuclear Hot Channel Factor Uncertainties, June 1988   |
|                    | WCAP-8218-P-A (P)<br>WCAP-8219-A      | Fuel Densification Experimental Results and Model for Reactor Application, March 1975                                 |
|                    | WCAP-8359                             | Effects of Fuel Densification Power Spikes on Clad Thermal Transients, July 1974                                      |
|                    | WCAP-7811                             | Power Distribution Control of Westinghouse Pressurized Water Reactors, December 1971                                  |
|                    | WCAP-8385 (P)<br>WCAP-8403            | Power Distribution Control and Load Following Procedures, September 1974  |

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**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number | Title  |
|--------------------|------------------------------------|--|
| 4.3                | WCAP-10216-P-A (P)<br>WCAP-10217-A | Relaxation of Constant Axial Offset Control, F <sub>Q</sub> Surveillance Technical Specification, Revision 1A, February 1994                                 |
|                    | WCAP-7912-P-A (P)<br>WCAP-7912-A   | Power Peaking Factors, January 1975  |
|                    | WCAP-8498                          | Incore Power Distribution Determination in Westinghouse Pressurized Water Reactors, July 1975  |
|                    | WCAP-9217                          | Results of Control Rod Worth Program, October 1977   |
|                    | WCAP-3696-8                        | Pressurized Water Reactor pH - Reactivity Effect Final Report, October 1968  |
|                    | WCAP-3680-20                       | Xenon-Induced Spatial Instabilities in Large Pressurized Water Reactors, March 1968  |
|                    | WCAP-3680-21                       | Control Procedures for Xenon-Induced X-Y Instabilities in Large Pressurized Water Reactors, February 1969  |
|                    | WCAP-3680-22                       | Xenon-Induced Spatial Instabilities in Three Dimensions, September 1969  |
|                    | WCAP-7964                          | Axial Xenon Transient Tests at the Rochester Gas and Electric Reactor, June 1971   |
|                    | WCAP-7084-P-A (P)                  | The PANDA Code, February 1975  |
|                    | WCAP-7213-A (P)<br>WCAP-7758-A     | The TURTLE 24.0 Diffusion Depletion Code, February 1975  |
|                    | WCAP-8768                          | Safety-Related Research and Development for Westinghouse Pressurized Water Reactors, Program Summaries - Winter 1977 - Summer 1978, Revision 2, October 1978 |
|                    | WCAP-6073                          | LASER - A Depletion Program for Lattice Calculations Based on MUFT and THERMOS, April 1966   |
|                    | WCAP-2048                          | The Doppler Effect for a Non-Uniform Temperature Distribution in Reactor Fuel Elements, July 1962  |

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**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number | Title   |
|--------------------|------------------------------------|---|
| 4.3                | WCAP-11596-P-A (P)                 | Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores, June 1988   |
|                    | WCAP-10841 (P)<br>WCAP-10842       | Qualification of the PHOENIX/POLCA Nuclear Design and Analysis Program for Boiling Water Reactors, June 1985  |
|                    | WCAP-7806                          | Nuclear Design of Westinghouse Pressurized Water Reactors with Burnable Poison Rods, December 1971  |
|                    | WCAP-3385-56 Part II               | Saxton Core II Fuel Performance Evaluation Part II: Evaluation of Mass Spectrometric and Radiochemical Analysis of Irradiated Saxton Plutonium Fuel, July 1971                      |
|                    | WCAP-3385-56 Part I                | Saxton Core II - Fuel Performance Evaluation Part I: Materials, September 1971  |
|                    | WCAP-3385-36                       | Saxton Plutonium Project - Quarterly Progress Report for the Period Ending June 20, 1973, July 1973   |
|                    | WCAP-3385-37                       | Saxton Plutonium Project - Quarterly Progress Report for the Period Ending September 30, 1973, December 1973  |
|                    | WCAP-3017-6094                     | Yankee Core Evaluation Program Final Report, January 1971   |
|                    | WCAP-6086                          | Supplementary Report on Evaluation of Mass Spectrometric and Radiochemical Analyses of Yankee Core I Spent Fuel, Including Isotopes of Elements Thorium through Curium, August 1969 |
|                    | WCAP-3269-26                       | LEOPARD - A Spectrum Dependent Non-Spatial Depletion Code for the IBM-7094, September 1963  |
|                    | WCAP-10965-P-A (P)                 | ANC: Westinghouse Advanced Nodal Computer Code, September 1986  |
|                    | WCAP-3726-1                        | PuO <sub>2</sub> -UO <sub>2</sub> Fueled Critical Experiments, July 1967  |
|                    | WCAP-13589-A (P)<br>WCAP-14297-A   | Assessment of Clad Flattening and Densification Power Spike Factor Elimination in Westinghouse Nuclear Fuel, March 1995   |
|                    | WCAP-13524 (P)                     | APOLLO - A One Dimensional Neutron Theory Program, Revision 1, August 1994  |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title  |
|--------------------------|---------------------------------------|--|
| 4.4                      | WCAP-11397-P-A                        | Revised Thermal Design Procedure, April 1989   |
|                          | WCAP-6065                             | Melting Point of Irradiated UO <sub>2</sub> , February 1965  |
|                          | WCAP-10444-P-A                        | Reference Core Report VANTAGE 5 Fuel Assembly,<br>September 1985   |
|                          | WCAP-9226-P<br>WCAP-9227-NP           | Reactor Core Response to Excessive Secondary Steam<br>Releases, January 1989                             |
|                          | WCAP-7695-L                           | DNB Test Results for R-Grid Thimble Cold Wall Cells,<br>Addendum 1, October 1972                         |
|                          | [WCAP-12488-A                         | <i>Westinghouse Fuel Criteria Evaluation Process,<br/>October 1994</i> ]*                                |
|                          | WCAP-7015                             | Subchannel Thermal Analysis of Rod Bundle Cores,<br>Revision 1, January 1969                             |
|                          | WCAP-7941-P-A<br>WCAP-7959-A          | Effect of Axial Spacing on Interchannel Thermal Mixing<br>with the R Mixing Vane Grid, January 1975      |
|                          | WCAP-8298-P-A (P)<br>WCAP-8290-A      | The Effect of 17x17 Fuel Assembly Geometry on<br>Interchannel Thermal Mixing, January 1975               |
|                          | WCAP-8174 (P)<br>WCAP-8202-A          | Effect of Local Heat Flux Spikes on DNB in Non<br>Uniform Heated Rod Bundles, August 1973                |
|                          | WCAP-7667-P-A (P)<br>WCAP-7755-A      | Interchannel Thermal Mixing with Mixing Vane Grids,<br>January 1975                                      |
|                          | WCAP-8691                             | Fuel Rod Bow Evaluation, Revision 1, July 1979   |
|                          | WCAP-8054-P-A (P)<br>WCAP-8195-A      | Applications of THINC-IV Program to PWR Design,<br>October 1973  |
|                          | WCAP-7956-P-A                         | THINC-IV, An Improved Program for Thermal-<br>Hydraulic Analysis of Rod Bundle Cores, February 1989      |
|                          | WCAP-2923                             | In-Pile Measurement of UO <sub>2</sub> Thermal Conductivity,<br>March 1966                               |
|                          | WCAP-10851-P-A                        | Improved Fuel Performance Models for Westinghouse<br>Fuel Rod Design and Safety Evaluations, August 1988 |
|                          | WCAP-8720<br>Addendum 2               | Revised PAD Code Thermal Safety Model,<br>October 1982   |

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**MATERIAL REFERENCED**

| DCD Section Number           | Westinghouse Topical Report Number | Title  |  |
|------------------------------|------------------------------------|--|--|
| 4.4                          | WCAP-6069                          | Burnup Physics of Heterogeneous Reactor Lattices, June 1965  |  |
|                              | WCAP-3385-56 Part II               | Saxton Core II Fuel Performance Evaluation: Evaluation of Mass Spectrometric and Radiochemical Analyses of Irradiated Saxton Plutonium Fuel, July 1970 |  |
|                              | WCAP-2850 (P)<br>WCAP-7916         | Single-Phase Local Boiling and Bulk Boiling Pressure Drop Correlations, June 1972  |  |
|                              | WCAP-7912-P-A (P)<br>WCAP-7912-A   | Power Peaking Factors, January 1975  |  |
|                              | WCAP-12330-P-A                     | Improved THINC-IV Modeling for PWR Core Design, August 1989  |  |
|                              | WCAP-8453-A                        | Analysis of Data from the Zion (Unit 1) THINC Verification Test, May 1976  |  |
|                              | WCAP-14371                         | AP600 Low Flow Critical Heat Flux (CHF) Test Data Analysis, May 1995   |  |
|                              | WCAP-10951-P-A                     | WESTAR: An Advanced Three Dimensional Program for Thermal-Hydraulic Analysis of Light Water Reactors. June 1988  |  |
|                              | 5.2                                | WCAP-7907-P-A (P)<br>WCAP-7907-A   | LOFTRAN Code Description, April 1984   |
|                              |                                    | WCAP-9292  | Dynamic Fracture Toughness of ASME SA-508 Class 2a and ASME SA-533 Grade A Class 2 Base and Heat-Affected Zone Material and Applicable Weld Metals, March 1978 |
| WCAP-7477-L (P)<br>WCAP-7735 |                                    | Sensitized Stainless Steel in Westinghouse PWR Nuclear Steam Supply Systems, March 1970  |  |
| WCAP-8324-A                  |                                    | Control of Delta Ferrite in Austenitic Stainless Steel Weldments, June 1975  |  |
| WCAP-8693                    |                                    | Delta Ferrite in Production Austenitic Stainless Steel Weldments, January 1976   |  |
| WCAP-14837                   |                                    | AP600 Shutdown Evaluation Report, Revision 3, March 1998   |  |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title   |
|--------------------------|---------------------------------------|---|
| 5.4                      | WCAP-14837                            | AP600 Shutdown Evaluation Report, Revision 3,<br>March 1998   |
| 6.2                      | WCAP-8077 (P)<br>WCAP-8078            | Ice Condenser Containment Pressure Transient Analysis<br>Methods, March 1973  |
|                          | WCAP-8264-P-A (P)<br>WCAP-8312-A      | Westinghouse Mass and Energy Release Data for<br>Containment Design, June 1975  |
|                          | WCAP-10325 (P)                        | Westinghouse LOCA Mass and Energy Release Model<br>for Containment Design - March 1979 Version, May<br>1983                     |
|                          | WCAP-8822 (P)<br>WCAP-8860            | Mass and Energy Releases Following A Steam Line<br>Rupture, September 1976  |
|                          | WCAP-7907-P-A (P)<br>WCAP-7907-A      | LOFTRAN Code Description, June 1984   |
|                          | WCAP-14234                            | LOFTRAN and LOFTTR2 AP600 Code Applicability<br>Document, Revision 1, August 1997   |
|                          | WCAP-12945-P (P)                      | Code Qualification Document for Best Estimate<br>Analysis, Revision 1, March 1998   |
|                          | WCAP-14407 (P)<br>WCAP-14408          | WGOTHIC Application to AP600, Revision 3, April<br>1998   |
|                          | WCAP-14601                            | AP600 Accident Analyses Evaluation Models,<br>Revision 2, June 1998   |
| 6.3                      | WCAP-8966                             | Evaluation of Mispositioned ECCS Valves,<br>September 1977  |
|                          | WCAP-13662                            | FMEA of Advanced Passive Plant, Revision 1,<br>June 1998  |
|                          | WCAP-14837                            | AP600 Shutdown Evaluation Report, Revision 3,<br>March 1998   |
| 6A                       | WCAP-14407 (P)<br>WCAP-14408          | WGOTHIC Application to AP600, Revision 3,<br>April 1998   |
|                          | WCAP-14135 (P)<br>WCAP-14138          | Final Data Report for Passive Containment Cooling<br>System Large Scale Test, Phase 2 and Phase 3,<br>Revision 3, November 1998 |

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**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number | Title   |
|--------------------|------------------------------------|---|
| 7.1                | WCAP-13382 (P)                     | AP600 Instrumentation and Control Hardware Description, May 1992  |
|                    | WCAP-13391                         |   |
|                    | [WCAP-13383                        | <i>AP600 Instrumentation and Control Hardware and Software Design, Verification, and Validation Process Report, Revision 1, June 1996]*</i> |
|                    | WCAP-8897 (P)                      | Bypass Logic for the Westinghouse Integrated Protection System, Addendum 2, February 1994   |
|                    | WCAP-8898                          |   |
|                    | [WCAP-14605 (P)                    | <i>Westinghouse Setpoint Methodology for Protection Systems - AP600, April 1996]*</i>   |
|                    | WCAP-14606                         |   |
|                    | WCAP-14080 (P)                     | AP600 Instrumentation and Control Software Architecture and Operation Description, June 1994  |
|                    | WCAP-14081                         |   |
|                    | WCAP-11340 (P)                     | Noise, Fault, Surge, and Radio Frequency Interference Test Report, November 1986  |
|                    | WCAP-13633 (P)                     | AP600 Instrumentation and Control Defense-in-Depth and Diversity Report, April 1993   |
|                    | WCAP-13634                         |   |
| 7.2                | WCAP-13662                         | FMEA of Advanced Passive Plant Protection System, Revision 1, June 1998   |
| 8.3                | WCAP-13856                         | AP600 Implementation of the Regulatory Treatment of Nonsafety-Related Systems Process, Revision 1, January 1998                             |
| 10.2               | WCAP-11525                         | Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency, June 1987  |
| 13.7               | WCAP-14690                         | Designer's Input to Procedure Development for the AP600, Revision 1, June 1997  |
|                    | WCAP-14837                         | AP600 Shutdown Evaluation Report, Revision 3, March 1998  |
| 14.3               | WCAP-13856                         | AP600 Implementation of the Regulatory Treatment of Nonsafety-Related Systems Process, Revision 1, January 1998                             |
| 15.0               | WCAP-11397-P-A (P)                 | Revised Thermal Design Procedure, April 1989  |
|                    | WCAP-11398-A                       |   |

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**MATERIAL REFERENCED**

| DCD Section Number         | Westinghouse Topical Report Number | Title   |  |
|----------------------------|------------------------------------|---|--|
| 15.0                       | WCAP-10054-P-A (P)<br>WCAP-10081   | Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code, August 1985          |  |
|                            | WCAP-12945 (P)                     | Code Qualification Document for Best Estimate LOCA Analysis, Revision 1, March 1998         |  |
|                            | WCAP-7908 (P)<br>WCAP-7337         | FACTRAN - A FORTRAN-IV Code for Thermal Transients in a UO <sub>2</sub> Fuel Rod, June 1972 |  |
|                            | WCAP-7907-P-A (P)<br>WCAP-7907-A   | LOFTRAN Code Description, April 1984  |  |
|                            | WCAP-7979-P-A (P)<br>WCAP-8028-A   | TWINKLE - A Multi-Dimensional Neutron Kinetics Computer Code, January 1975                  |  |
|                            | WCAP-10698-P-A (P)<br>WCAP-10750-A | SGTR Analysis Methodology to Determine the Margin to Steam Generator Overfill, August 1985  |  |
|                            | WCAP-14234                         | LOFTRAN and LOFTTR2 AP600 Code Applicability Document, Revision 1, August 1997              |  |
|                            | WCAP-14477                         | The AP600 Adverse System Interactions Evaluation Report, Revision 2, November 1997          |  |
|                            | 15.1                               | WCAP-7907-P-A (P)<br>WCAP-7907-A  | LOFTRAN Code Description, April 1984         |
|                            |                                    | WCAP-11397-P-A (P)<br>WCAP-11398-A  | Revised Thermal Design Procedure, April 1989 |
| WCAP-9226 (P)<br>WCAP-9227 |                                    | Reactor Core Response to Excessive Secondary Steam Releases, January 1978                   |  |
| WCAP-7908 (P)<br>WCAP-7337 |                                    | FACTRAN - A FORTRAN-IV Code for Thermal Transients in a UO <sub>2</sub> Fuel Rod, June 1975 |  |
| WCAP-14234                 |                                    | LOFTRAN and LOFTTR2 AP600 Code Applicability Document, Revision 1, August 1997              |  |
| 15.2                       | WCAP-7769                          | Overpressure Protection for Westinghouse Pressurized Water Reactors, Revision 1, June 1972  |  |

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**MATERIAL REFERENCED**

| <b>DCD<br/>Section<br/>Number</b> | <b>Westinghouse Topical<br/>Report Number</b> | <b>Title</b>  |
|-----------------------------------|---|---|
| 15.2                              | WCAP-7907-P-A (P)<br>WCAP-7907-A              | LOFTRAN Code Description, April 1984  |
|                                   | WCAP-9230 (P)<br>WCAP-9231                    | Report on the Consequences of a Postulated Main<br>Feedline Rupture, January 1978   |
|                                   | WCAP-11397-P-A (P)<br>WCAP-11398-A            | Revised Thermal Design Procedure, April 1989  |
|                                   | WCAP-14234                                    | LOFTRAN and LOFTTR2 AP600 Code Applicability<br>Document, Revision 1, August 1997   |
| 15.3                              | WCAP-7908 (P)<br>WCAP-7337                    | FACTRAN - A FORTRAN-IV Code for Thermal<br>Transients in a UO <sub>2</sub> Fuel Rod, June 1975  |
|                                   | WCAP-7907-P-A (P)<br>WCAP-7907-A              | LOFTRAN Code Description, April 1984  |
|                                   | WCAP-8424                                     | An Evaluation of Loss of Flow Accidents Caused by<br>Power System Frequency Transients in Westinghouse<br>PWRs, Revision 1, May 1975                  |
| 15.4                              | WCAP-11397-P-A (P)<br>WCAP-11398-A            | Revised Thermal Design Procedure, April 1989  |
|                                   | WCAP-7979-P-A (P)<br>WCAP-8028-A              | TWINKLE - A Multi-Dimensional Neutron Kinetics<br>Computer Code, January 1975   |
|                                   | WCAP-7908 (P)<br>WCAP-7337                    | FACTRAN - A FORTRAN-IV Code for Thermal<br>Transients in a UO <sub>2</sub> Fuel Rod, June 1972  |
|                                   | WCAP-7907-P-A (P)<br>WCAP-7907-A              | LOFTRAN Code Description, April 1984  |
|                                   | WCAP-7588                                     | An Evaluation of the Rod Ejection Accident in<br>Westinghouse Pressurized Water Reactors Using Spatial<br>Kinetics Methods, Revision 1A, January 1975 |
|                                   | WCAP-11397-P-A (P)<br>WCAP-11398-A            | Revised Thermal Design Procedure, April 1989  |
|                                   | WCAP-7213-P-A (P)<br>WCAP-7758-A              | The TURTLE 24.0 Diffusion Depletion Code,<br>February 1975  |
|                                   | WCAP-10965-P-A                                | Westinghouse Advanced Nodal Computer Code,<br>September 1980  |

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Table 1.6-1 (Sheet 15 of 19)

**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number | Title   |
|--------------------|------------------------------------|---|
| 15.5               | WCAP-7907-P-A (P)<br>WCAP-7907-A   | LOFTRAN Code Description, April 1984  |
| 15.6               | WCAP-10924-P-A (P)                 | Westinghouse Large Break Best Estimate Methodology, Volume 1 Model Description and Validation, Volume 2, Revision 2, Application to Two-Loop PWRs Equipped with Upper Plenum Injection, December 1988 |
|                    | WCAP-12945-P (P)                   | Code Qualification Document for Best Estimate Analysis, Revision 1, March 1998  |
|                    | WCAP-10924-P                       | Westinghouse Large Break LOCA Best Estimate Methodology, Volume 2, Addendum 3, Upper Plenum Injection Model Improvement, April 1991   |
|                    | WCAP-10079-P-A (P)<br>WCAP-10080-A | NOTRUMP – A Nodal Transient Small Break and General Network Code, August 1985   |
| 15.6               | WCAP-10054-P-A (P)<br>WCAP-10081-A | Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code, August 1985  |
|                    | WCAP-7907-P-A (P)<br>WCAP-7907-A   | LOFTRAN Code Description, April 1984  |
|                    | WCAP-7908 (P)<br>WCAP-7337         | FACTRAN - A FORTRAN-IV Code for Thermal Transients in a UO <sub>2</sub> Fuel Rod, June 1975   |
|                    | WCAP-11397-P-A (P)<br>WCAP-11398-A | Revised Thermal Design Procedure, April 1989  |
|                    | WCAP-10698-P-A (P)<br>WCAP-10750-A | SGTR Analysis Methodology to Determine the Margin to Steam Generator Overfill, August 1987  |
|                    | WCAP-14206 (P)                     | Applicability of the NOTRUMP Computer Code to AP600 SSAR Small-Break LOCA Analyses, November 1994   |
|                    | WCAP-14601 (P)                     | AP600 Accident Analyses – Evaluation Models, Revision 2, June 1998  |
|                    | WCAP-14234                         | LOFTRAN and LOFTTR2 AP600 Code Applicability Document, Revision 1, August 1997  |
|                    | WCAP-14171                         | WCOBRA/TRAC Applicability to AP600 Large-Break Loss-of-Coolant Accident, Revision 2, March 1998   |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title   |
|--------------------------|---------------------------------------|---|
| 15.6                     | WCAP-14807                            | NOTRUMP Final Validation Report for AP600,<br>Revision 5, August 1998   |
|                          | WCAP-14776                            | WCOBRA/TRAC OSU Long-Term Cooling Final<br>Validation Report, Revision 4, April 1998  |
| 15.7                     | WCAP-7828                             | Radiological Consequences of a Fuel Handling Accident,<br>December 1971   |
| 16.1                     | WCAP-9272-P-A                         | Westinghouse Reload Safety Evaluation Methodology,<br>July 1985   |
|                          | WCAP-8385                             | Power Distribution Control and Load Following<br>Procedures, September 1974   |
|                          | WCAP-10216-P-A                        | Relaxation of Constant Axial Offset Control $F_Q$<br>Surveillance Technical Specifications, Revision 1A,<br>February 1994         |
|                          | WCAP-12945-P-A                        | Code Qualification Document for Best Estimate<br>Analysis, Revision 1, March 1998   |
|                          | WCAP-14807                            | NOTRUMP Final Validation Report for AP600,<br>Revision 5, August 1998   |
|                          | WCAP-12474-P-A                        | BEACON Core Monitoring and Operations Support<br>System, August 1994, and Addendum 1, May 1996                                    |
|                          | WCAP-8746-A                           | Design Basis for the Overtemperature $\Delta T$ and the<br>Overpower $\Delta T$ Trips, March 1977                                 |
|                          | WCAP-9273-NP-A                        | Westinghouse Reload Safety Evaluation Methodology,<br>July 1985   |
|                          | WCAP-8403                             | Power Distribution Control and Load Following<br>Procedures, July 1985  |
|                          | WCAP-14606                            | Westinghouse Setpoint Methodology for Protection<br>Systems, April 1996   |
|                          | WCAP-10271-P-A (P)                    | Evaluation of Surveillance Frequencies and Out of<br>Service Times for the Reactor Protection Instrumentation<br>System, May 1986 |
|                          | WCAP-7924-A                           | Basis for Heatup and Cooldown Limit Curves,<br>April 1975   |

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**MATERIAL REFERENCED**

| DCD<br>Section<br>Number | Westinghouse Topical<br>Report Number | Title  |
|--------------------------|---------------------------------------|--|
| 16.1                     | WCAP-7769                             | Topical Report on Overpressure Protection,<br>October 1971   |
|                          | WCAP-14837                            | AP600 Shutdown Evaluation Report, Revision 3,<br>March 1998  |
|                          | WCAP-14800                            | AP600 PRA Thermal/Hydraulic Uncertainty Evaluation<br>for Passive System Reliability, June 1997  |
| 17.6                     | WCAP-8370                             | Energy Systems Business Unit - Nuclear Fuel Business<br>Unit Quality Assurance Plan, Revision 12a  |
|                          | WCAP-8370/7800                        | Energy Systems Business Unit - Power Generation<br>Business Unit Quality Assurance Plan, Revision 11A/7A                                   |
|                          | WCAP-12600                            | AP600 Advanced Light Water Reactor Design Quality<br>Assurance Program Plan, Revision 4, January 1998                                      |
|                          | WCAP-13856                            | AP600 Implementation of the Regulatory Treatment of<br>Nonsafety-Related Systems Process, Revision 1,<br>January 1998                      |
| 18.1                     | WCAP-14645                            | Human Factors Engineering Operating Experience<br>Review Report for the AP600 Nuclear Power Plant,<br>Revision 2, December 1996            |
|                          | WCAP-14644                            | AP600 Functional Requirements Analysis and Function<br>Allocation, September 1996  |
|                          | WCAP-14694                            | Designer's Input to Determination of the AP600 Main<br>Control Room Staffing Level, July 1996  |
|                          | [WCAP-14651                           | <i>Integration of Human Reliability Analysis with Human<br/>Factors Engineering Design Implementation Plan,<br/>Revision 2, May 1997]*</i> |
|                          | WCAP-14690                            | Designer's Input to Procedure Development for the<br>AP600, Revision 1, June 1997  |
|                          | WCAP-14655                            | Designer's Input to the Training of the Human Factors<br>Engineering Verification and Validation Personnel,<br>Revision 1, August 1996     |
| 18.1                     | [WCAP-14401                           | <i>Programmatic Level Description of the AP600 Human<br/>Factors Verification of Validation Plan, Revision 3, April<br/>1997]*</i>         |

\*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.

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**MATERIAL REFERENCED**

| DCD Section Number | Westinghouse Topical Report Number | Title   |
|--------------------|------------------------------------|---|
| 18.2               | WCAP-14645                         | Human Factors Engineering Operating Experience Review Report for the AP600 Nuclear Power Plant, Revision 2, December 1996         |
|                    | WCAP-14694                         | Designer's Input to Determination of the AP600 Main Control Room Staffing Level, July 1996  |
|                    | [WCAP-14822                        | <i>AP600 Quality Assurance Procedures Supporting NRC Review of AP600 SSAR Sections 18.2 and 18.8, February 1997]*</i>             |
|                    | WCAP-14644                         | AP600 Functional Requirements Analysis and Function Allocation, September 1996  |
| 18.3               | WCAP-14645                         | Human Factors Engineering Operating Experience Review Report for the AP600 Nuclear Power Plant, Revision 2, December 1996         |
| 18.4               | WCAP-14644                         | AP600 Functional Requirements Analysis and Function Allocation, September 1996  |
| 18.5               | WCAP-10170                         | Emergency Response Facilities Design and V&V Process, April 1982  |
|                    | [WCAP-14695                        | <i>Description of the Westinghouse Operator Decision Making Model and Function Based Task Analysis Methodology, July 1996]*</i>   |
|                    | [WCAP-14651                        | <i>Integration of Human Reliability Analysis and Human Factors Engineering Design Implementation Plan, Revision 2, May 1997]*</i> |
|                    | [WCAP-14396                        | <i>Man-in-the-Loop Test Plan Description, Revision 2, January 1997]*</i>  |
| 18.6               | WCAP-14694                         | Designer's Input to Determination of the AP600 Main Control Room Staffing Level, July 1996  |
| 18.7               | [WCAP-14651                        | <i>Integration of Human Reliability Analysis and Human Factors Engineering Design Implementation Plan, Revision 2, May 1997]*</i> |
| 18.8               | [WCAP-14396                        | <i>Man-in-the-Loop Test Plan Description, Revision 2, January 1997]*</i>  |
|                    | [WCAP-14651                        | <i>Integration of Human Reliability Analysis and Human Factors Engineering Design Implementation Plan, Revision 2, May 1997]*</i> |

\*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.

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## MATERIAL REFERENCED

| DCD Section Number | Westinghouse Topical Report Number | Title   |
|--------------------|------------------------------------|---|
| 18.8               | [WCAP-14401                        | <i>Programmatic Level Description of the AP600 Human Factors Verification of Validation Plan, Revision 3, April 1997]*</i>                    |
|                    | [WCAP-14695                        | <i>Description of the Westinghouse Operator Decision Making Model and Function Based Task Analysis Methodology, July 1996]*</i>               |
|                    | WCAP-14655                         | Designer's Input to the Training of the Human Factors Engineering Verification and Validation Personnel, Revision 1, August 1996              |
|                    | WCAP-14690                         | Designer's Input to Procedure Development for the AP600, Revision 1, June 1997  |
|                    | WCAP-10170                         | Emergency Response Facilities Design and V&V Process, April 1982  |
|                    | WCAP-14694                         | Designer's Input to Determination of the AP600 Main Control Room Staffing Level, July 1996  |
|                    | [WCAP-14701                        | <i>Methodology and Results of Defining Evaluation Issues for the AP600 Human System Interface Design Test Program, Revision 1, May 1997]*</i> |
| 18.9               | WCAP-14690                         | Designer's Input to Procedure Development for the AP600, Revision 1, May 1997   |
| 18.10              | WCAP-14655                         | Designer's Input to the Training of the Human Factors Engineering Verification and Validation Personnel, Revision 1, August 1996              |
| 18.11              | [WCAP-14701                        | <i>Methodology and Results of Defining Evaluation Issues for the AP600 Human System Interface Design Test Program, Revision 1, May 1997]*</i> |
|                    | [WCAP-14396                        | <i>Man-in-the-Loop Test Plan Description, Revision 2, January 1997]*</i>  |
|                    | [WCAP-14401                        | <i>Programmatic Level Description of the AP600 Human Factors Verification of Validation Plan, Revision 3, April 1997]*</i>                    |
| 18.12              | [WCAP-14651                        | <i>Integration of Human Reliability Analysis with Human Factors Engineering Design Implementation Plan, Revision 2, May 1997]*</i>            |
|                    | WCAP-13793                         | The AP600 System/Event Matrix, June 1994  |

\*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.