

ADAMS Doc #	Sites	Utility/Org.	GOTHIC Vers.	Date of Approval	Title	Description
ML003683137	Arkansas Nuclear One 1&2	Entergy Nuclear Operations	6.1	Jul-99	Review of Arkansas Nuclear One (Units 1 & 2) Waterhammer and Two-Phase Flow Analysis	License Amendment Review in association with response to GL 96-06, a GOTHIC model was used to assist in the evaluation of potential water hammer and two-phase flow issues for containment unit coolers during Loss of Coolant Accident (LOCA) and Main Steam Line Breaks (MSLB).
ML003731334	Arkansas Nuclear One 2	Entergy Nuclear Operations	6.1	29-Jun-00	TS Change Request for ANO-2 Containment Cooling System	Technical Specification Change Request using GOTHIC to analyze the effects of flashing in the service water coils following a Loss of Coolant Accident (LOCA) or Main Steam Line Break (MSLB).
ML003759252	Arkansas Nuclear One 2	Entergy Nuclear Operations	6.1	4-Oct-00	Supplemental Information Regarding Containment Cooling System License Amendment Request	Supplemental Information Regarding TS Change Request using GOTHIC to analyze the effects of flashing in the service water coils following a Loss of Coolant Accident (LOCA) or Main Steam Line Break (MSLB).
ML003769248 (SER)	Arkansas Nuclear One 2	Entergy Nuclear Operations	6.1	13-Nov-00	Arkansas Nuclear One, Unit No. 2 - Issuance of Amendment Re: Containment Cooling System (TAC No. MA9351)	License Amendment Approval for use of GOTHIC to analyze the effects of flashing in the service water coils following a Loss of Coolant Accident (LOCA) or Main Steam Line Break (MSLB).
ML060100325	Beaver Valley 1&2	FirstEnergy Nuclear Operating Co.	6.0/7.0	6-Feb-06	Issuance of Amendments RE: Containment Conversion from Subatmospheric to Atmospheric Operating Conditions	License Amendment documenting use of GOTHIC as an industry standard comparison for containment response during Loss of Coolant Accident (LOCA) and Main Steam Line Breaks (MSLB).
ML003683691	Browns Ferry 1 (retired), 2, & 3	Tennessee Valley Authority	Not Stated	15-Feb-00	Response to Generic Letter 96-06 Concerning Waterhammer, Two-Phase Flow, and Expansion of Entrapped Water in Piping	Response to GL 96-06 using GOTHIC to evaluate boiling potential in the RBCCW system under Main Steam Line Break (MSLB) or Loss of Coolant Accident (LOCA) conditions.
ML060540205	Brunswick 1&2	Duke Energy	Not Stated	2-Mar-06	Issuance of Amendment RE: Main Steam Isolation Valve Leakage Limit (TAC Nos. MC8106 and MC8107)	License Amendment using GOTHIC to analyze the temperature profile of the Main Steam Lines (MSL) under post-Loss of Coolant Accident (LOCA) conditions.
ML021130572	Clinton	Exelon Generation Co., LLC	6.1	16-Nov-01	Request for Amendment to Appendix A, Technical Specifications to Revise Suppression Pool Water Level and Upper Containment Pool Water Level Requirements in Mode 3	Amendment Request documenting GOTHIC use for suppression pool hydrodynamic load analysis during a Loss of Coolant Accident (LOCA) and long term heat sink during a Main Steam Line Break (MSLB).
ML030990603	Clinton	Exelon Generation Co., LLC	Not Stated	28-Mar-03	Additional Information Supporting the License Amendment Request to Revise Suppression Pool Water Level and Upper Containment Pool Water Level Requirements in Mode 3	Additional Information supporting the Amendment Request which documents GOTHIC use for suppression pool hydrodynamic load analysis during a Loss of Coolant Accident (LOCA) and long term heat sink during a Main Steam Line Break (MSLB).
ML031290397 (SER)	Clinton	Exelon Generation Co., LLC	Not Stated	12-Jun-03	Issuance of Amendment (TAC No. MB3578)	Approval of Amendment Request documenting GOTHIC use for suppression pool hydrodynamic load analysis during a Loss of Coolant Accident (LOCA) and long term heat sink during a Main Steam Line Break (MSLB).
ML081510173	Comanche Peak 1&2	TXU Generating Company	7.2a	27-Jun-08	Issuance of Amendments RE: License Amendment Request 07-004, Revision to Operating License and Technical Specification 1.0, "Use and Application," to Revise Thermal Power From 3458 MWt to 3612 MWt (TAC Nos. MD6615 and MD6616)	Approval of Amendment Request documenting use of GOTHIC containment analysis under Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) conditions.
ML042930637	Cooper	Nebraska Public Power District (NPPD)	7.0	14-Oct-04	10CFR50.59(d)(2) Summary Report	10 CFR 50.59 Summary Report for use of GOTHIC for Reactor Building HELB and Post-LOCA Heat-up (PLHU) analyses resulting in new temperature and pressure profiles for Equipment Qualification (EQ) purposes.
ML080390454	Diablo Canyon 1&2	Pacific Gas & Electric Co.	7.2	1-Feb-08	License Amendment Request 08-01, Revision to Technical Specification 5.5.16, "Containment Leakage Rate Testing Program"	License Amendment Request citing the use of GOTHIC for Loss of Coolant Accident (LOCA) containment response analysis to support installation of replacement SGs.

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ML033010437	Duane Arnold	NextEra Energy Duane Arnold, LLC	Not Stated	20-Oct-03	Report of Facility Changes, Tests and Experiments, Fire Plan Changes and Commitment Changes	Report of Facility Change documenting use of GOTHIC for High Energy Line Break (HELB) both inside and outside containment and Loss of Coolant Accident (LOCA) as part of the Environmental Qualification (EQ) Program and Extended Power Uprate (EPU).
ML003675775	Farley 1&2	Southern Nuclear Operating Co.	Not Stated	29-Dec-99	Safety Evaluation Related to Amendment Nos. 147 and 138	Safety Evaluation Report discussing the use of GOTHIC for Extended Power Uprate (EPU) analyses, and approving use of GOTHIC for containment pressure and temperature response to Loss of Coolant Accident (LOCA) and Main Steam Line Breaks (MSLB). Short-term subcompartment analyses were also completed with GOTHIC.
ML030360205	Fort Calhoun	Omaha Public Power District (OPPD)	7.0	27-Jan-03	License Amendment Request, "Containment Pressure Analysis using the GOTHIC Computer Code"	License Amendment Request documenting use of GOTHIC for design basis containment analyses such as a Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) for Environmental Qualification (EQ) purposes as part of the steam generator replacement project.
ML081140390	Fort Calhoun	Omaha Public Power District (OPPD)	7.2a	2-May-08	Issuance of Amendment Re: Modification of Containment Spray Actuation Logic and Dampers in Containment Air Cooling and Filtering System	Issuance of Amendment documenting the use of GOTHIC for containment response to design-basis Main Steam Line Break (MSLB), Loss of Coolant Accident (LOCA) Mass and Energy (M&E), and Equipment Qualification (EQ).
ML051260236	Ginna	Constellation Energy	7.2	29-Apr-05	License Amendment Request Regarding Main Feedwater Isolation Valves	License Amendment Request describing the use of GOTHIC to reanalyze the containment pressure response for Steam Line Breaks (SLBs).
ML061380249	Ginna	Constellation Energy	7.2	11-Jul-06	Safety Evaluation Related to Extended Power Uprate	Safety Evaluation approving the use of GOTHIC in Loss of Coolant Accident (LOCA) and High Energy Line Break (HELB) analyses for calculating pressure and temperature conditions within the containment.
ML020580402	Grand Gulf 1	Entergy Nuclear Operations	6.1	25-Feb-02	License Amendment Request New Special Operations Limiting Condition for Operation Suppression Pool Makeup-Mode 3	License Amendment Request for use of GOTHIC in determining the containment temperature and pressure response as well as hydrodynamic loads during Mode 3 Main Steam Line Breaks (MSLBs) and Loss of Coolant Accidents (LOCAs).
ML022490416	Grand Gulf 1	Entergy Nuclear Operations	6.1	6-Sep-02	Issuance of Amendment Re: Reactor Cavity Pool Draindown	Approval of License Amendment Request to use GOTHIC in determination of the containment temperature and pressure response as well as hydrodynamic loads during Mode 3 Main Steam Line Breaks (MSLBs) and Loss of Coolant Accidents (LOCAs). GOTHIC was also used for calculation of the Mass and Energy (M&E) release during a LOCA.
ML041620616	Indian Point 3	Entergy Nuclear Operations	Not Stated	3-Jun-04	Stretch Power Uprate License Amendment Request Package	License Amendment Request using GOTHIC for analysis of a Main Steam Line Break (MSLB) outside containment.
ML003760486	Kewaunee (Retired)	Dominion Generation	6.0	12-Oct-00	Submittal of Topical Report WPSRSEM-NP "Reload Safety Evaluation Methods for Application to Kewaunee"	Topical Report noting the adoption of GOTHIC for containment analysis in response to Loss of Coolant Accidents (LOCAs) and Main Steam Line Breaks (MSLBs).
ML003770282	Kewaunee (Retired)	Dominion Generation	Not Stated	20-Nov-00	Completion of Follow-Up To Containment Analysis Methodology - Entrainment Assumptions in Updated Final Safety Analysis Report	Follow-Up to Topical Report noting the adoption of GOTHIC for containment analysis in response to Loss of Coolant Accidents (LOCAs) and Main Steam Line Breaks (MSLBs).
ML010230257	Kewaunee (Retired)	Dominion Generation	Not Stated	23-Jan-01	Request for Additional Information Related to Reload Safety Evaluation Methods Topical Report	RAI to Topical Report noting the adoption of GOTHIC for containment analysis in response to Loss of Coolant Accidents (LOCAs) and Main Steam Line Breaks (MSLBs).
ML010320469 (SER)	Kewaunee (Retired)	Dominion Generation	Not Stated	1-Feb-01	Request for Additional Information Related to Reload Safety Evaluation Methods Topical Report	RAI to Topical Report noting the adoption of GOTHIC for containment analysis in response to Loss of Coolant Accidents (LOCAs) and Main Steam Line Breaks (MSLBs).

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ML013270088	McGuire 1&2	Duke Energy Power Company, LLC	Not Stated	25-Nov-97	Issuance of Amendments - TAC No. M99763 and M99764	Safety Evaluation and License Amendment for use of GOTHIC to analyze Large Break Loss of Coolant Accidents (LBLOCAs) in containment.
ML102920333	Nine Mile Point 2	Constellation Energy	7.2b	8-Oct-10	Supplemental Information Re: License Amendment Request for Extended Power Uprate (TAC No. ME 1476)	Supplemental LAR Information documenting the use of GOTHIC for Loss of Coolant Accident (LOCA) containment analysis.
ML040960040	North Anna 2	Dominion Generation/ Virginia Electric	6.1	1-Apr-04	Issuance of Amendment Re: Use of Framatome ANP Advanced Mark-BW Fuel	Approval of License Amendment comparing GOTHIC as an industry benchmark to ICECON (S-RELAP5) for LOCA phenomena in facilities using dry or ice condenser containments.
ML103470388	Oconee 1, 2, & 3	Duke Energy Power Company, LLC	7.0 or GOTHIC 4.0/DUKE	7-Dec-10	High Energy Line Break License Amendment Request - Response to RAI	HELB License Amendment Request using GOTHIC to calculate pressure and temperature response inside the penetration rooms following a MSLB or main feedwater break and the pressure response in enclosed areas of the Auxiliary Building with postulated breaks in the plant heating system.
ML053060340	Palisades	Entergy Nuclear Operations	7.1 (Patch 1)	19-Oct-05	Report of Facility Changes, Tests and Experiments and Summary of Commitment Changes (10 CFR 50.59)	10 CFR 50.59 Summary Report documenting the use of GOTHIC to evaluate containment response to Loss of Coolant Accidents (LOCAs) and Main Steam Line Breaks (MSLBs).
ML11123A168	Palisades	Entergy Nuclear Operations	7.2a	21-Apr-11	Final Safety Analysis Report Update - Revision 29	Update to Final Safety Analysis Report documenting use of GOTHIC for modeling containment air coolers and containment response to a Loss of Coolant Accident (LOCA).
ML042360680	Perry 1	FirstEnergy Nuclear Operating Co.	7.0	26-Aug-04	Correction to Safety Evaluation Report (SER) in Support of License Amendment 130	Safety Evaluation Report documenting use of GOTHIC to perform analyses of Main Steam Line Leaks and Room Heat-up in the Turbine Building.
ML091250564	Point Beach 1&2	NextEra Energy Point Beach, LLC	7.2a	7-Apr-09	License Amendment Request 261, Extended Power Uprate	License Amendment Request for Extended Power Uprate including use of GOTHIC for compartment response following a Loss of Coolant Accident (LOCA), Main Steam Line Break (MSLB) and High Energy Line Break (HELB) event.
ML052000046	Prairie Island 1&2	Xcel Energy	7.0 and 7.1 (Patch 1)	12-Aug-05	Issuance of Amendments Re: Request for Use of GOTHIC 7 in Containment Response Analyses	Amendment Approval discussing the use of GOTHIC for Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) containment pressure and temperature analysis.
ML091460809	Prairie Island 1&2	Xcel Energy	7.2a	1-Jul-09	Issuance of Amendments Re: Technical Specifications Changes to Allow Use of Westinghouse 0.422-inch OD 14x14 Vantage+ Fuel	Amendment Approval noting prior approval of GOTHIC for Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) containment pressure and temperature analysis. Amendment adds use of GOTHIC for calculating mass and energy (M&E) release peak pressure and temperatures.
ML050140453	Seabrook 1	NextEra Energy Seabrook, LLC	7.0 (Patch 2)	28-Feb-05	Issuance of Amendment RE: 5.2 Percent Power Uprate (TAC No. MC 2364)	Approval of Amendment siting use of GOTHIC for long-term Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB) containment response.
ML993630211	South Texas 1&2	STP Nuclear Operating Co.	5.0e	20-Dec-99	Request for Additional Information, Generic Letter 96-06	RAI, in association with response to GL 96-06, mentioning use of GOTHIC for the evaluation of water hammer and two-phase flow in containment unit coolers. The submittal includes reference to an EPRI report (Containment Air Cooler Heat Transfer During Loss of Coolant Accident (LOCA) with Loss of Offsite Power Conditions (LOOP)) used for code validation by STP.
ML11291A120	South Texas 1&2	STP Nuclear Operating Co.	Not Stated	10-Oct-11	10CFR50.59 Summary Report	10 CFR 50.59 Summary Report detailing use of GOTHIC for containment pressure and temperature analysis during Main Steam Line Break (MSLB) events.

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ML073120506	Surry 1&2	Dominion Generation/ Virginia Electric	Not Stated	15-Nov-07	Issuance of Amendments RE: Alternate Use of GOTHIC Code for Recirculation Spray System - Exigent Circumstances	Amendment approving the use of GOTHIC for Net Positive Suction Head (NPSH) and Loss of Coolant Accident (LOCA) analyses.
ML083170346	Three Mile Island 1	Exelon Generation Co., LLC	Not Stated	10-Nov-08	Response to RAI Related to GL 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors"	Response to RAI describing use of GOTHIC for Low Pressure Injection (LPI) and Building Sump (BS) pump Net Positive Suction Head margin (NPSHm) analyses post-LOCA.
ML011650380	Vermont Yankee	Entergy Nuclear Operations	5.0e	28-Dec-98	Issuance of Amendment to Facility Operating License No. DPR-28	Amendment approving use of GOTHIC to analyze suppression pool heatup following various heat rejection load scenarios (based on DBA-LOCA).
ML031600761	Vogtle 1&2	Southern Nuclear Operating Co.	Not Stated	4-Jun-03	Issuance of Amendments (TAC Nos. MB5046 and MB5047)	Safety Evaluation and License Amendment for use of GOTHIC for evaluating environmental conditions to ensure the environmental qualification of Class IE safety-related equipment; and evaluating temperature response to MSLBs in the MSIV area.
ML003760500	Waterford 3	Entergy Nuclear Operations	Not Stated	6-Oct-00	Issuance of License Amendment No. 165, Reduction in Operable Containment Fan Coolers in the Containment Cooling System (TAC No. MA6997)	Amendment approving use of GOTHIC for evaluating containment pressure and temperature response after LOCA and MSLB accidents.
ML010320373	Waterford 3	Entergy Nuclear Operations	Not Stated	1-Feb-01	Issues Identified by Entergy Operations, Inc. in the Staff Safety Evaluation Issued with License Amendment No. 165, Reduction in Operable Containment Fan Coolers in the Containment Cooling System (TAC No. MA6997)	NRC Approval of use of GOTHIC for containment response to both LOCA and MSLB accidents.
ML051030068	Waterford 3	Entergy Nuclear Operations	7.0	15-Apr-05	Issuance of Amendment RE: Extended Power Uprate	Safety Evaluation and License Amendment for use of GOTHIC to calculate containment response for LOCA and MSLB events, in support of Extended Power Uprate (EPU).
ML021900076	Watts Bar 1	Tennessee Valley Authority	Not Stated	3-Jul-02	Licensee Event Report	Event Report describing the use of GOTHIC to assess environmental impacts of an AFWP Steam leak in the AB.
ML070800193	Wolf Creek 1	Wolf Creek Nuclear Operating Co.	7.2a	14-Mar-07	Revision to TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)"	Technical Specification (TS) revision discussing the use of GOTHIC for updated containment pressure and temperature analyses during a postulated MSLB.
ML003780723	McGuire Nuclear Station and Catawba Nuclear Station	Duke Energy	4.0/DUKE	18-Dec-00	Mass and Energy Release and Containment Response Methodology	Topical Report documenting the use of GOTHIC to simulate the mass and energy releases (M&E) and containment response to Loss of Coolant Accidents (LOCA) and Main Steam Line Breaks (MSLB) with a non-uniform ice weight distribution in the ice condenser.
ML041980470	PWR Dry Containments	Framatome ANP	7.1	13-Jul-04	Request for Approval of BAW-10252(P), Revision 0, "Analysis of Containment Response to Postulated Pipe Ruptures Using GOTHIC"	A Letter from Framatome ANP requesting approval for the use of GOTHIC to predict the maximum containment pressure and temperature response and mass and energy (M&E) release for a spectrum of High Energy Line Breaks (HELBs).
ML041980475	PWR Dry Containments	Areva/ Framatome ANP, Inc	7.1	Jul-04	Analysis of Containment Response to Postulated Pipe Ruptures Using GOTHIC	Report documenting the use of GOTHIC to predict the maximum containment pressure and temperature response and mass and energy (M&E) release for a spectrum of High Energy Line Breaks (HELBs).

LOCA, MSLB, and M&E SERs

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ML051400280	Prairie Island 1&2	Nuclear Management Company, LLC	7.1 (Patch 1)	17-May-05	Supplement to License Amendment Request (LAR) Dated September 1, 2004, Request for Use of GOTHIC 7 in Containment Response Analyses (TAC Nos. MC4245 and MC4246)	Request to NRC for the use of GOTHIC 7 to model PINGP containment response for Loss of Coolant Accidents (LOCA) and Main Steam Line Break (MSLB) accidents.
ML062430591	--	Westinghouse Electric Company	7.2a	Aug-06	Westinghouse Containment Analysis Methodology	Report discussing the use of GOTHIC for analyzing containment response to Loss of Coolant Accidents (LOCA) and Main Steam Line Breaks (MSLB) for both PWRs and BWRs.
ML072140123	US-APWR	Mitsubishi	7.2a	Jul-07	Large Break LOCA Code Applicability Report for US-APWR	Applicability Report stating use of GOTHIC for APWR containment backpressure analysis during a Loss of Coolant Accident (LOCA).
ML072150282	US-APWR	Mitsubishi	7.2a	Jul-07	LOCA Mass and Energy Release Analysis Code Applicability Report for US-APWR	Applicability Report stating use of GOTHIC for APWR post-reflood mass and energy (M&E) release and containment response using Inter Process Communication (IPC) with WREFLOOD during a Loss of Coolant Accident (LOCA).
ML090230441	--	Westinghouse Electric Company	7.2a	27-Jan-09	Final Safety Evaluation of Topical Report WCAP-16608-P, Rev. 0, "Westinghouse Containment Analysis Methodology"	Final Safety Evaluation from NRC staff approving use of GOTHIC as described in the Westinghouse Containment Analysis Methodology Report.
ML090780493	US EPR	AREVA	Not Stated	24-Mar-11	Chapter 6 of US EPR Safety Evaluation Report	Safety Evaluation Report documenting the use of GOTHIC for containment response analysis during Loss of Coolant Accidents (LOCA) and Main Steam Line Breaks (MSLB).
ML11131A133	McGuire 1&2	Duke Energy	Not Stated	12-Sep-11	Issuance of Amendments Regarding Technical Specification Changes to Allow Manual Operation of the Containment Spray System (TAC Nos. ME4051 and ME4052)	Amendment approving use of GOTHIC for containment analysis during Large Break Loss of Coolant Accidents (LBLOCA).
ML050680191	PWR Dry Containments	Framatome ANP	7.0	7-Mar-05	Letter to NRC "Request for Approval of BAW-10252(P), Revision 0, 'Analysis of Containment Response to Postulated Pipe Ruptures Using GOTHIC' "	Letter requesting approval of TR BAW-10252 in which GOTHIC is used for containment response analysis during postulated pipe ruptures.