OMB No.: 3150-0012
NRCB 92-01, SUPP. 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555

August 28, 1992

NRC BULLETIN NO. 92-01, SUPPLEMENT 1: FAILURE OF THERMO-LAG 330 FIRE BARRIER SYSTEM TO PERFORM ITS SPECIFIED FIRE ENDURANCE FUNCTION

Addressees

For Action:

All holders of operating licenses for nuclear power reactors

For Information:

All holders of construction permits for nuclear power reactors

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this bulletin supplement to notify licensees and construction permit holders of additional apparent failures in fire endurance testing associated with the Thermo-Lag 330 fire barrier system which many plants have installed to protect safe shutdown capability, to request all operating reactor licensees that have Thermo-Lag fire barriers to take the recommended actions, and to require that these licensees submit a written response to the NRC describing the actions taken associated with this bulletin supplement.

Background

On August 6, 1991, the NRC issued Information Notice (IN) 91-47, "Failure of Thermo-Lag Fire Barrier Material To Pass Fire Endurance Test," which contained information on the fire endurance tests performed by the Gulf States Utilities Company on Thermo-Lag 330 fire barrier systems installed on wide aluminum cable trays and the associated failures. On December 6, 1991, the NRC issued IN 91-79, "Deficiencies In The Procedures For Installing Thermo-Lag Fire Barrier Materials," which contained information on deficiencies in procedures that the vendor (Thermal Science, Inc.) supplied for installing Thermo-Lag 330 fire barrier material. Recognizing the concerns stated in INs 91-47 and 91-79 regarding the Thermo-Lag 330 fire barrier system, Texas Utilities (TU) Electric instituted a fire endurance testing program to qualify its Thermo-Lag 330 electrical raceway fire barrier systems for its Comanche Peak Steam Electric Station. On June 17-23, 1992, TU Electric conducted the first series of these "full scale" fire endurance tests at Omega Point Laboratories in San Antonio, Texas.

The results of these tests have raised questions regarding the ability of the Thermo-Lag 330 fire barrier system to perform its specified function as a 1-hour fire barrier. On June 23, 1992, the NRC issued IN 92-46, "Thermo-Lag Fire Barrier Material Special Review Team Final Report Findings, Current Fire Endurance Testing, and Ampacity Calculation Errors," in which it discussed the safety implications of these questions. On June 24, 1992, the NRC issued NRC Bulletin 92-01, "Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free From Fire Damage."

Description of Circumstances

TU Electric and the NRC recently sponsored additional testing of Thermo-Lag 330 material.

TESTS SPONSORED BY TU ELECTRIC

On August 19-21, 1992, TU Electric sponsored a second series of tests at the Omega Point Laboratory to aid in qualifying its Thermo-Lag 330 electrical raceway fire barrier systems for its Comanche Peak Steam Electric Station.

This series of tests consisted of 1-hour fire endurance tests (using the ASTM E-119 Standard Time Temperature Curve) on a variety of cable tray and conduit "mock-ups." TU Electric designed these "mock-ups" or test articles to duplicate existing installed plant configurations. Plant personnel used stock material to construct the test articles. The Thermo-Lag fire barriers were installed on the test articles in accordance with TU Electric's Thermo-Lag installation procedures. TU Electric wrote these procedures based on vendor recommended installation procedures.

The Thermo-Lag fire barrier systems for the TU Electric test articles were constructed using pre-formed 1-hour Thermo-Lag 330 panels and conduit shapes. The joints and seams were constructed by pre-buttering seams and joints with trowel grade Thermo-Lag 330-1 and holding the assembly together with stainless steel banding as required by TU procedures and as the system is installed in the plant.

The articles tested during this series of tests consisted of a conduit configuration, which exposed five conduits of various sizes (3-inch, 2-inch, 1-1/2-inch and two 3/4-inch) to the same test fire, a 24-inch wide cable tray with a T-section and a 30-inch wide cable tray.

On August 19, 1992, TU Electric performed a 1-hour fire endurance test on the conduit configuration. The fire barrier systems installed on the 3-inch, 2-inch and 1-1/2-inch conduits and their associated cable pull boxes were constructed using 1-hour Thermo-Lag 330 conduit pre-shapes and panels, respectively. The 3/4-inch conduits were constructed using a Thermo-Lag 330 conduit pre-shape as a base material. The two 3/4-inch conduits were divided at the middle of the test specimen, and four different enhanced barrier systems were tested. The first of these consisted of a 3/4-inch conduit run, one half of which was protected by a 3/4-inch Thermo-Lag 330 fire barrier conduit pre-shape, and the other half protected with a 1/2-inch thick conduit pre-shape with a wire mesh "stress skin" applied on the exterior and 1/4-inch of trowel grade Thermo-Lag applied to the stress skin. One half of the second 3/4-inch conduit run was protected by a 1/2-inch thick conduit pre-shape with a 1/4-inch thick Thermo-Lag flexi-blanket wrap. The other half was protected by a 1/2-inch thick conduit pre-shape with a 1/4-inch thick pre-shape overlay. TU Electric did not conduct a hose stream test after the fire endurance test. The post-fire visual inspection of the test specimen revealed that the interface joints between the vertical conduit runs and the cable pull boxes had opened and exposed conduit metal surfaces to the fire. In addition, the cables exhibited visible fire damage to cable jackets in all conduits, except for the 3/4-inch conduit protected by the 1/2-inch thick conduit pre-shape with the 1/4-inch pre-shape overlay. Throughout the fire endurance test, the thermocouple temperatures on the cables inside the 3/4-inch conduit protected by the overlay never reached 163 °C (325 °F). All other conduit configurations exceeded 163° (325 °F) on the cables during the test.

On August 20, 1992, TU Electric sponsored a test of a 24-inch wide ladder back tray with a T-tray configuration. Post-fire inspection of this specimen revealed that five joint and seam type openings had occurred. These openings were both in horizontal and vertical runs of the cable tray. Fire damage to the cables was also identified during the post-fire inspection, raising questions whether the cables would have functioned properly during a fire. The thermocouples indicated that internal temperatures in certain areas of the test article exceeded 163 °C (325 °F) at 47 minutes. The maximum monitored cable temperature during the test was 194 °C (381 °F).

On August 21, 1992, TU Electric sponsored a test of a 30-inch wide ladder back tray configuration. During the post-fire inspection of this specimen, five joint and seam type openings were identified in horizontal and vertical runs of the cable tray. The Thermo-Lag barrier also experienced areas of loss of its material, leaving spots of bare stress skin covering the tray. Fire damage to the cables was identified during the post-fire inspection. Thermocouples indicated that internal temperatures in certain areas of the test article exceeded 163 °C (325 °F) at 30 minutes. The maximum monitored cable temperature during the test was approximately 371 °C (700 °F).

Although previous tests conducted by TU Electric (see Bulletin 92-01) resulted in the apparent successful performance of large diameter conduits and narrow trays, new information provided by these recent tests has led the NRC to believe that potential early failures of Thermo-Lag barriers are not limited to specific sizes. The NRC considers the openings at the joints and seams of the Thermo-Lag material to be of high significance. The characteristics of the configurations of the material protecting the trays or conduits in question seemed to impact the effectiveness of the barrier material more than their specific sizes. The tests sponsored by TU Electric revealed that the Thermo-Lag material lost its structural integrity primarily at the seams and joints and that cable damage was most significant at these seam and joint separations.

Following the tests conducted in June 1992, the test assemblies were subjected to hose streams which altered the conditions of the barriers. Due to the hose stream, post-fire inspection of these assemblies for joint failures and burn through was prevented. The assemblies tested in August 1992 were cooled with water, essentially leaving the test assemblies in the condition they were in at the completion of the fire test. Areas of burn through and seam and joint failures were observed during post-fire inspection.

Further, the TU Electric assemblies tested in June 1992 were constructed using supports that were covered with two layers of Thermo-Lag material. The assemblies tested in August 1992 had supports which were insulated to only 9 inches, corresponding to the TU Electric actual plant installations. Thus, the June 1992 tests did not model the installed plant configuration, as was the case in the August 1992 tests.

TESTS SPONSORED BY THE NRC

On July 15 and 17, 1992, the NRC sponsored a series of "small scale" fire endurance tests on 1- and 3-hour Thermo-Lag 330 pre-formed fire barrier panels at the National Institute of Standards and Technology (NIST). On July 27, 1992, the NRC issued the results of the first series of small scale tests in IN 92-55, "Current Fire Endurance Test Results for Thermo-Lag Fire Barrier Material." On August 6-7 and 14, 1992, the NRC sponsored a second series of 1- and 3-hour small scale fire endurance tests on Thermo-Lag 330 fire barrier pre-formed panels.

On July 15, 1992, the NRC sponsored a 1-hour fire endurance test. The 1-hour panel stress skin was oriented away from the fire exposure, according to vendor recommendation. The average thermocouple reading on the unexposed surface exceeded 162.7 °C (325 °F) in approximately 22 minutes, and the unexposed surface of the material reached an average temperature of 652 °C (1206 °F) at 45 minutes. The unexposed surface of the material exhibited visible browning in 35 minutes. During the test, the thermocouple on the unexposed surface reached a peak reading of 935 °C (1716 °F), exceeding the corresponding furnace temperature of 923 °C (1694 °F), as the material burned and added heat to the baseline furnace temperature. The panels burned through at two locations in 46 minutes, resulting in a corresponding drop in surface thermocouple readings as the cold air entered the furnace. After 1 hour, approximately 85 percent of the unexposed surface was blackened.

On July 17, 1992, the NRC sponsored a 3-hour test. The 3-hour panels had stress skin installed on both sides of the Thermo-Lag material. To prepare for the test, the technicians installed the ribbed side of the specimen on the unexposed side with the non-ribbed side of the material towards the furnace side. The stress skin on the furnace side of the specimen was restrained by the furnace specimen support lip during the test. The average thermocouple reading exceeded 162.7 °C (325 °F) in 2 hours and 20 minutes, the average temperature at the end of 3 hours was 206 °C (403 °F), and the peak of thermocouple reading was 222 °C (432 °F). After the test, the material was soft and exhibited plastic deformation, and the fire-exposed stress skin crumbled upon contact. Nevertheless, visible signs of damage on the unexposed side were limited to off-gassing, slight browning, and crystallization at the surface.

On August 5, 1992, the NRC sponsored a fire endurance test on a 3-hour Thermo-Lag fire barrier panel, which had stress skin on both sides. The edges of the stress skin of the 3-hour material were cut away from the exposed side of the panel so that the outer edges of the stress skin contacted the support lip of the furnace. The stress skin was kept from being restrained in compression at the edges of the panel around the lip of the furnace. The average thermocouple temperature of the unexposed surface exceeded the ASTM E-119 temperature acceptance criterion of 163 °C (325 °F) in 45 minutes. After 1 hour, the unexposed surface temperature reading was 756 °C (1392 °F). At 1 hour and 20 minutes, the panel was burned through. This 3-hour configuration performed quite differently during this test than did the Thermo-Lag 330 fire barrier panel in the July 17, 1992, 3-hour fire test in which the stress skin was restrained on the side exposed to the fire. In this previous test, the average unexposed surface temperature of the restrained specimen did not exceed 163 °C (325 °F) until 2 hours and 20 minutes into the test, and the maximum temperature at the end of the 3-hour test was 194 °C (381 °F). The specimen tested on July 17, 1992 did not burn through.

On August 6, 1992, the NRC sponsored a second 1-hour fire endurance test on a Thermo-Lag 330 1-hour panel, which had stress skin on one side only. This panel was placed on the furnace with the stress skin towards the fire, although the vendor recommends that the 1-hour panel be installed with the stress skin away from the fire exposure. The deviation from the vendor recommendation aided in the determination of the material's sensitivity to installation variations. The stress skin was restrained by the furnace specimen support lip. The average unexposed surface temperature of the specimen exceeded 163 °C (325 °F) in 34 minutes, and at 1 hour, the maximum temperature of the unexposed surface was 237 °C (458 °F). However, the specimen was not burned through. The performance of the specimen in this test was superior to the specimen tested on July 15, 1992, at which the stress skin faced the unexposed side, as recommended by the vendor. The specimen tested on July 15, 1992, exceeded the 163 °C (325 °F) acceptance criterion in 20 minutes and the unexposed surface reached 649 °C (1200 °F) in 37 minutes. Burn through was observed in 46 minutes.

On August 7, 1992, the NRC sponsored a third 3-hour fire endurance test. Two 1-hour fire barriers were dry fitted together with their stress skins on the outer sides of the test specimen. As in the test conducted on August 5, the exposed side stress skin was trimmed away to prevent the material from being restrained. One hour into the test, the specimen abruptly began releasing gases, and the thermocouple readings inside the furnace indicated that the thermocouple had come into contact with burning material. The average thermocouple reading exceeded 163 °C (325 °F) in 1 hour and 26 minutes. After 2 hours, burn holes were observed in several locations. After the burn holes formed, unexposed surface thermocouple readings oscillated dramatically, with a peak reading of 947 °C (1737 °F) at the end of the test. Nonetheless, this test specimen performed better than did the prefabricated 3-hour panel with its stress skin trimmed away.

On August 14, 1992, the NRC sponsored a final 3-hour test, again using two 1-hour panels dry fitted together with their stress skins on the outer sides of the test specimen. The stress skin was not trimmed away from the specimen for this test; it was restrained in compression at the edges of the panel. The average thermocouple reading exceeded 163 °C (325 °F) in 2 hours and 40 minutes and reached 176 °C (349 °F) at the end of the test. Visible signs of damage were limited to off-gassing and slight crystallization at the surface of the unexposed side, and no browning was observed.

The following table summarizes the data collected during these small scale tests.

Test Date	Barrier Rating	Stress Skin Restraint	Stress Skin Orientation	Time to Exceed 163 °C* (hrs:min)	Burn Through (hrs:min)
7/15/92	1 hour	N/A	unexposed	0:22	0:46
8/06/92	1 hour	restrained	exposed	0:34	none
7/17/92	3 hour	restrained	both sides	2:20	none
8/05/92	3 hour	unrestrained	both sides	0:45	1:20
8/07/92	3 hour**	unrestrained	both sides	1:26	2:03
8/14/92	3 hour**	restrained	both sides	2:40	none

* Average unexposed surface thermocouple temperature
** Two 1-hour panels fitted face to face

In IN 92-55, the staff listed specific furnace specifications and test assembly parameters used in both series of tests conducted by NIST.

The NRC views the results of the NIST tests as indicative of an inability of the Thermo-Lag material itself to provide protection according to its specified fire resistive rating, depending on its configuration. The tests conducted at NIST were not considered definitive in that the tests were not full scale and only panels were tested. However, the information gleaned from the tests provided enough evidence to the NRC to confirm doubts raised during the TU Electric tests, such as the bare stress skin observed following the TU 30-inch wide cable tray test on August 21, 1992, discussed above, leading to a conclusion that Thermo-Lag fire barriers should be treated as inoperable in the absence of successful, applicable plant specific tests.

Discussion

Section 50.48(a) of Title 10 of the Code of Federal Regulations (10 CFR 50.48(a)) requires that each operating nuclear power plant have a fire protection plan that satisfies Appendix A to 10 CFR Part 50, General Design Criteria (GDC) 3, "Fire Protection." GDC 3 requires that structures, systems, and components important to safety be designed and located to minimize, in a manner consistent with other safety requirements, the probability and effects of fires and explosions. 10 CFR 50.48(b) states that Appendix R to 10 CFR Part 50 establishes fire protection features required to satisfy

Criterion 3 of Appendix A to 10 CFR Part 50 for certain generic issues for nuclear power plants licensed to operate before January 1, 1979. Sections III.G, III.J, and III.O of Appendix R apply to nuclear power plants licensed to operate before January 1, 1979. In 10 CFR 50.48(e), the NRC requires that all licensees for plants licensed to operate after January 1, 1979 shall complete all fire protection modifications needed to satisfy Criterion 3 of Appendix A to 10 CFR Part 50 in accordance with the provisions of their operating licenses.

NRC-approved plant fire protection programs as referenced by the Plant Operating License Conditions and Appendix R to 10 CFR Part 50, Section III G.1.a, "Fire Protection of Safe Shutdown Capability," require one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control stations to be free from fire damage.

To ensure that electrical cables and components are free from fire damage, Section III G.2 of Appendix R requires the separation of safe shutdown trains by separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a 3-hour rating or enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition to providing the 1-hour barrier, a fire detection and an automatic fire suppression system shall be installed in the fire area.

Under fire conditions, the thermal degradation of fire barrier systems (e.g., walls, floors, equipment vaults, and electrical raceway enclosures), such as the Thermo-Lag system, could lead to both trains of safe shutdown systems being damaged by fire. This may significantly affect the plant's ability to achieve and maintain hot standby or shutdown conditions.

The NRC considered the apparent failures of the recent Thermo-Lag fire barrier fire endurance tests and determined that the 1- and 3-hour pre-formed assemblies installed on conduits, cable trays (of all sizes and configurations), and used to construct fire barrier walls and ceilings, and equipment enclosures do not provide the level of safety as required by NRC requirements. The tests sponsored by TU Electric raised concerns relating to joint and seam separation leading to cable damage. In addition, they raise concerns about the potential for burn through of the Thermo-Lag material itself. The tests sponsored by the NRC appear to confirm concerns relating to burn through of the Thermo-Lag material in certain configurations in the absence of joints and seams.

Requested Actions

All holders of operating licenses for nuclear power reactors, immediately upon receiving this bulletin supplement, are requested to take the following actions. These actions are essentially the same as those listed in Bulletin 92-01, but the scope has been expanded to include all sizes of conduits and trays and to include walls, ceilings, and equipment enclosures.

1. For those plants that use either 1- or 3-hour pre-formed Thermo-Lag 330 panels and conduit shapes, identify the areas of the plant which have

Thermo-Lag 330 fire barrier material installed and determine the plant areas which use this material for the protection and separation of the safe shutdown capability.

2. In those plant areas in which Thermo-Lag fire barriers are used in raceways, walls, ceilings, equipment enclosures, or other areas to protect cable trays, conduits, or separate redundant safe shutdown functions, the licensee should implement, in accordance with plant procedures, the appropriate compensatory measures, such as fire watches, consistent with those that would be implemented by either the plant technical specifications or the operating license for an inoperable fire barrier. These compensatory measures should remain in place until the licensee can declare the fire barriers operable on the basis of applicable tests which demonstrate successful 1- or 3-hour barrier performance.

Although the specific details of this supplement to Bulletin 92-01 may not apply to holders of construction permits for nuclear power reactors, it is requested that the general concerns of this bulletin supplement be reviewed for current or future applicability.

Required Report

Each licensee who has installed Thermo-Lag 330 fire barriers must inform the NRC in writing within 30 days of receiving this bulletin supplement, whether or not it has taken the above actions. Where fire barriers are declared inoperable, the licensee is required to describe the measures being taken to ensure or restore fire barrier operability. These measures should be consistent with actions taken in response to Bulletin 92-01.

Backfit Discussion

These types of fire barriers are installed at operating power reactor sites and are required to meet either a condition of a plant's operating license or the requirements of Section III.G of Appendix R to 10 CFR Part 50. The actions requested by this bulletin supplement do not represent a new staff position but are considered necessary to bring licensees into compliance with existing NRC rules and regulations where these test results are relevant. Therefore, the NRC is issuing this bulletin supplement as a compliance backfit under 10 CFR 50.109(a)(4).

Address the required written reports to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended and 10 CFR 50.54(f). In addition, submit a copy to the appropriate regional administrator.

This request is covered by Office of Management and Budget Clearance Number 3150-0012, which expires June 30, 1994. The estimated average number of burden hours is 120 person hours for each licensee response, including those needed to assess the new recommendations, search data sources, gather and analyze the data, and prepare the required letters. This estimate of the average number of burden hours pertains only to the identified response-related matters and does not include the time needed to implement the requested action. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, Division of Information Support Services, Office of Information Resources Management, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to the Paperwork Reduction Project (3150-0012), Office of Information and Regulatory Affairs, NEOB-3019, Office of Management and Budget, Washington, D.C. 20503.

Although no specific response is required for the following information, the following information would assist the NRC in evaluating the cost of complying with this bulletin supplement:

(1) the licensee staff's time and costs to perform requested inspections, corrective actions, and associated testing;

(2) the licensee staff's time and costs to prepare the requested reports and documentation;

(3) the additional short-term costs incurred to address the inspection findings such as the costs of the corrective actions or the costs of down time; and

(4) an estimate of the additional long-term costs that will be incurred as a result of implementing commitments such as the estimated costs of conducting future inspections or increased maintenance.

If you should have any questions about this matter, please contact one of the technical contacts listed below or the appropriate NRR project manager.

Charles E. Rossi

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical contacts: Ralph Architzel, NRR
(301) 504-2804

Patrick Madden, NRR
(301) 504-2854

Attachment:
List of Recently Issued NRC Bulletins

LIST OF RECENTLY ISSUED NRC BULLETINS

Bulletin No.	Subject	Date of Issuance	Issued to
92-02	Safety Concerns Relating to "End of Life" of Aging Theratronics Teletherapy Units	08/24/92	All Teletherapy Licensees.
92-01	Failure of Thermo-Lag 330 Fire Barrier System to Maintain Cabling in Wide Cable Trays and Small Conduits Free from Fire Damage	06/24/92	All holders of OLs or CPs for nuclear power reactors.
91-01	Reporting Loss of Criticality Safety Controls	10/18/91	All fuel cycle and uranium fuel research and development licensees.
89-01, Supp. 2	Failure of Westinghouse Steam Generator Tube Mechanical Plugs	06/28/91	All holders of OLs or CPs for PWRs.
89-01, Supp. 1	Failure of Westinghouse Steam Generator Tube Mechanical Plugs	11/14/90	All holders of OLs or CPs for PWRs.
90-02	Loss of Thermal Margin Caused by Channel Box Bow	03/20/90	All holders of OLs or CPs for BWRs.
90-01	Loss of Fill-Oil in Transmitters Manufactured by Rosemount	03/09/90	All holders of OLs or CPs for nuclear power reactors.
89-03	Potential Loss of Required Shutdown Margin During Refueling Operations	11/21/89	All holders of OLs or CPs for PWRs.
88-10, Supp. 1	Nonconforming Molded-Case Circuit Breakers	08/03/89	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

analyze the data, and prepare the required letters. This estimate of the average number of burden hours pertains only to the identified response-related matters and does not include the time needed to implement the requested action. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch, Division of Information Support Services, Office of Information Resources Management, U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to the Paperwork Reduction Project (3150-0012), Office of Information and Regulatory Affairs, NEOB-3019, Office of Management and Budget, Washington, D.C. 20503.

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I G indicated no objections per phone call from I. Moghissi to J. Linsay on 8/27/92

* See previous concurrence.

SPLB:DST	SPLB:DST	SPLB:DST	SPLB:DST	OIG
*IMoghissi	*PMadden	*RArchitzel	*CMcCracken	GMulley
08/26/92	08/26/92	08/26/92	08/26/92	08/ /92
TechEd	DD:DST	D:DST	~~OGCB~~	~~D:DOEA~~
*JMain	*GHolahan	*AThadani	~~GMarcus~~	CRossi
08/25/92	08/26/92	08/26/92	~~08/ /92~~	08/26/92

DOCUMENT NAME: 92-01,BSP1

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08/26/92	08/26/92	08/26/92	08/26/92	08/ /92

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TechEd	DD:DST	D:DST	OGCB	D:DOEA
*JMain	*GHolahan	*AThadani	GMarcus	CRossi
08/25/92	08/26/92	08/26/92	08/ /92	08/ /92

DOCUMENT NAME: 92-01,BSP1

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TechEd *JMain 08/25/92	DD:DST GHolahan 08/26/92	D:DST AThadani 08/26/92	OGCB GMarcus 08/ /92	D:DOEA CRossi 08/ /92

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PMadden	RArchitzel	CMcCracken	GMarcus	
08/ /92	08/ /92	08/ /92	08/ /92	08/25/92
DD:DST	D:DST	D:DOEA		
GHolahan	AThadani	CRossi		
08/ /92	08/ /92	08/ /92		

DOCUMENT NAME: