

March 16, 2006

Mr. Britt T. McKinney
Sr. Vice President
and Chief Nuclear Officer
PPL Susquehanna, LLC
769 Salem Blvd., NUCSB3
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SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2 - ISSUANCE OF
AMENDMENT RE: REVISION TO TECHNICAL SPECIFICATIONS 3.3.8.1 AND
3.8.7 (TAC NO. MC6521)

Dear Mr. McKinney:

The Commission has issued the enclosed Amendment No. 208 to Facility Operating License No. NPF-22 for the Susquehanna Steam Electric Station, Unit 2 (SSES 2). The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated March 18, 2005, as supplemented by letter dated February 28, 2006.

The amendment revises the SSES 2 TS 3.3.8.1, "Loss of Power (LOP) Instrumentation," to (1) clarify that Condition A applies to the LOP instrumentation associated with both the Unit 1 and Unit 2 4.16 Kilovolt (kV) Engineered Safeguards System (ESS) buses since both the Unit 1 and Unit 2 buses are required to support Unit 2 operation, (2) add a new Condition B to allow the LOP instrumentation for two Unit 1 4.16kV ESS buses in the same division to be inoperable for up to 8 hours for the performance of Surveillance Requirement 3.8.1.19 on Unit 1. In addition, the amendment revises the SSES 2 TS 3.8.7, "Distribution Systems - Operating," to (1) eliminate "or more" and the plural to "subsystems" such that the condition will read "one Unit 1 AC [alternating current] electrical power distribution subsystem inoperable," and (2) add a new Condition D for two Unit 1 AC electrical power distribution subsystems inoperable.

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's Biweekly *Federal Register* Notice.

Sincerely,

/RA/

Richard V. Guzman, Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-388

Enclosures: 1. Amendment No. 208 to
License No. NPF-22
2. Safety Evaluation

cc w/encls: See next page

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PPL SUSQUEHANNA, LLC
ALLEGHENY ELECTRIC COOPERATIVE, INC.
DOCKET NO. 50-388
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2
AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 208
License No. NPF-22

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:
 - A. The application for the amendment filed by PPL Susquehanna, LLC, dated March 18, 2005, as supplemented on February 28, 2006, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of the Facility Operating License No. NPF-22 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 208 and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. PPL Susquehanna, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Richard J. Laufer, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: March 16, 2006

ATTACHMENT TO LICENSE AMENDMENT NO. 208

FACILITY OPERATING LICENSE NO. NPF-22

DOCKET NO. 50-388

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3.3-72

3.3-73

3.3-74

3.8-44

3.8-45

3.8-46

INSERT

TS / 3.3-72

TS / 3.3-73

TS / 3.3-74

TS / 3.8-44

TS / 3.8-45

TS / 3.8-46

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 208 TO FACILITY OPERATING LICENSE NO. NPF-22
PPL SUSQUEHANNA, LLC
ALLEGHENY ELECTRIC COOPERATIVE, INC.
SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2
DOCKET NO. 50-388

1.0 INTRODUCTION

By application dated March 18, 2005 (Agencywide Documents Access and Management System Accession No. ML050890379), as supplemented by letter dated February 28, 2006, PPL Susquehanna, LLC (PPL, the licensee), requested changes to the Technical Specifications (TSs) for Susquehanna Steam Electric Station, Unit 2 (SSES 2). The supplement dated February 28, 2006, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination.

The proposed changes to SSES 2 TS 3.3.8.1, "Loss of Power (LOP) Instrumentation," and TS 3.8.7, "Distribution Systems - Operating," are as follows:

- (a) TS Section 3.3.8.1, Condition A is revised to clarify that this condition applies to inoperable instrumentation except during the performance of Surveillance Requirement (SR) 3.8.1.19 (loss-of-coolant accident (LOCA)/loss of offsite power (LOOP) testing) on Unit 1. TS Bases Section B 3.3.8.1 is also revised to clarify that this condition is applicable to both Unit 1 and Unit 2 LOP instrumentation.
- (b) New Condition B to TS 3.3.8.1 is added to allow the LOP instrumentation for two Unit 1 4.16 Kilovolt (kV) engineered safeguards system (ESS) buses in the same division to be inoperable for up to 8 hours for the performance of SR 3.8.1.19 on Unit 1. Existing TS 3.3.8.1, Conditions B through D, are renumbered to accommodate new Condition B. TS Bases Section B 3.3.8.1 is also revised.
- (c) TS 3.8.7 Condition C is revised to eliminate "or more" and to make a subsystem singular such that the condition will read, "one Unit 1 alternating current (AC) electrical power distribution subsystem inoperable."
- (d) A new Condition D to TS 3.8.7 is added for two inoperable Unit 1 AC electrical power distribution subsystems. The new condition will apply to a single Unit 1 division (which comprises two subsystems) only during testing required by Unit 1 TS SR 3.8.1.19. This

new condition will impose an 8-hour completion time for restoration of at least one of the two Unit 1 AC distribution subsystems. Existing Conditions D through I are renumbered to accommodate new Condition D. Renumbered TS 3.8.7 Condition E is revised to include new Condition D. TS Bases Section B 3.8.7 is also revised.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance which the Nuclear Regulatory Commission (NRC) staff considered in its review of the application are as follows:

1. Title 10 of the *Code of Federal Regulations* (10 CFR) establishes the fundamental regulatory requirements with respect to the reactivity control systems. Specifically, General Design Criterion 17 (GDC-17), "Electric power systems," in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 states, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components that are important to safety. The onsite system must have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system must be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.
2. GDC-18, "Inspection and testing of electric power systems," requires that electric power systems that are important to safety be designed to permit appropriate periodic inspection and testing.
3. Section 50.36, "Technical specifications," provides the regulatory requirements for the content required in a licensee's TSs. Section 50.36 states, in part, that the TSs will include SRs to assure that the quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation (LCOs) will be met.

3.0 TECHNICAL EVALUATION

3.1 Background

The safety-related AC distribution system at SSES 1 and 2 consists of four 4.16 kV ESS buses, each of which has a primary and alternate offsite source of power and an onsite emergency diesel generator (EDG) that supports one 4.16 kV ESS bus in each unit. The onsite power system consists of four independent load groups, Channels A, B, C, and D. Each Load group consists of a Class 1E 4kV bus, a Class 1E 480V load center, Class 1E 480 volt (V) motor control centers, and a Class 1E 208/120V distribution panel. All safety-related loads are divided among these four load groups. Loss of any one load group will not prevent the minimum safety functions from being performed (i.e., three of the four load groups will meet the design basis requirement). Two divisionalized load groups are established from the four load groups

(Division I is comprised of Channels A and C; Division II, is comprised of Channels B and D) for those engineered safety feature loads which require one out of two load groups to meet the design basis requirements. The divisionalized loads are energized from the four load groups, rather than from just two load groups, for load diversity considerations. At all voltage levels (4kV, 480V, and 208/120V), divisionalized loads are fed from the channelized load groups. In addition, both units share parts of the Unit 1 AC distribution system, since the emergency service water (ESW), standby gas treatment system (SGTS), and control structure heating, ventilation, and air conditioner (HVAC) are energized only from the Unit 1 AC distribution system. Thus, some components required by Unit 2 receive power through Unit 1 electrical power distribution subsystems. The Unit 1 electrical power distribution subsystems needed to support the required Unit 2 equipment are addressed in the SSES 2 TS LCO 3.8.7, Table 3.8.7-1.

3.2 Proposed Change to TS Section 3.3.8.1, Condition A

The proposed revision to TS Section 3.3.8.1, Condition A will clarify that this condition applies to inoperable instrumentation except during the performance of SR 3.8.1.19 on Unit 1. Bases Section B 3.3.8.1, Condition A will be revised to state that the condition applies to the LOP instrumentation on the 4.16 kV ESS buses for both SSES 1 and 2 since both the Unit 1 and the Unit 2 4.16 kV ESS buses are required to support operation of Unit 2.

The NRC staff finds the revision to TS Section 3.3.8.1, Condition A, acceptable because it clarifies that the condition applies to inoperable LOP instrumentation, except during the performance of Unit 1 SR 3.8.1.19.

3.3 Proposed Change To Add New Condition B to TS 3.3.8.1

The new Condition B in TS 3.3.8.1 will allow the LOP instrumentation on two 4.16kV ESS buses in the same division to be inoperable for up to 8 hours for the performance of Unit 1 SR 3.8.1.19 during Unit 1 refueling outages. Unit 1 TS SR 3.8.1.19 (i.e., testing system response to a LOOP signal in conjunction with an ECCS initiation signal) must be performed during Unit 1 refueling outages. This surveillance is performed for each division individually so that the LOP instrumentation becomes inoperable on only one division of buses (the instrumentation is inhibited from performing its function to facilitate ECCS response timing). During these tests, Unit 2 is normally operating at full power. SSES 2 TS 3.3.8.1, "Loss of Power (LOP) Instrumentation," requires Unit 1 to have the LOP instrumentation operable to support certain common loads. This Unit 1 testing makes the LOP instrumentation for the Unit 1 4.16 kV ESS buses inoperable. Since the common 4.16 kV loads are not by the Unit 2 AC distribution system, the corresponding Unit 2 surveillance test does not similarly affect Unit 1 operations or compliance with Unit 1 TS 3.3.8.1.

In its March 18, 2005, submittal, PPL provided the following technical justification for the proposed change to TS 3.3.8.1:

[...]Normally during the performance of SR 3.8.1.19, the LOP instrumentation can be returned to operable status within one hour provided there are no issues with the test equipment etc. Having additional time to perform the surveillance test allows for correction of minor issues and does not adversely affect human performance while still being able to support the mitigation of accident conditions.

During the Unit 1 performance of SR 3.8.1.19, sufficient equipment is available to support mitigation of accident conditions in Unit 2. The resulting combination of all four Unit 2 4.16 kV ESS buses (both Divisions) and the Unit 2 required portions of the two remaining Unit 1 4.16kV ESS buses is sufficient to support accident mitigation and subsequent safe shutdown of Unit 2.

Additionally, performance of the Unit 1 test does not result in the inability of any emergency diesel generator to support its associated Unit 2 AC distribution subsystem. The diesels are fully loaded to support the Unit 1 testing for approximately one hour. This meets the requirement to run fully loaded for a five-minute period to fulfill the TS SR 3.8.1.19. Although considered highly unlikely, if a design basis loss of coolant accident (LOCA) and loss of offsite power occurs on Unit 2 during this test, the operator would be directed to take manual compensatory actions. These operator actions have been addressed in the test procedure. The operator would take immediate action to shed non-essential loads from the Unit 1 loaded diesels to prepare the diesels for the accident loads via the load sequence timers in Unit 2.

If a loss of offsite power event alone were to occur to one or both units during the Unit 1 tests, the AC distribution subsystems not associated with the tested subsystems are capable of supporting the minimum safety functions necessary to shutdown the reactor(s) and maintain them in a safe shutdown condition. Therefore, the required AC buses must be restored to operable status within a relatively short period of time. The 8-hour Completion Time (Required Action A.1) balances the benefit of performing the required test with the low probability of a loss of offsite power or LOCA with loss of offsite power while one division is inoperable for the duration of the test.

The NRC staff reviewed why two load groups have to be de-energized in order to perform SR 3.8.1.19 and why one load group cannot be deenergized to perform this SR. PPL indicated during the February 1, 2006, teleconference with NRC (ML060730525) and in its February 28, 2006, supplemental response, that it is possible to perform the LOCA/LOOP surveillance one load group at a time; however, testing in this manner does not adequately test the design of the plant as adverse interactions between the load groups would not be detectable. The design of the plant for a LOCA/LOOP relies upon the EDGs to all start and load onto their respective 4 kV ESS bus in each unit. Design features exist that preclude adverse interaction between any of the load groups. Testing 2 load groups (a division) at the same time, verifies that there is no adverse interaction between the 2 load groups.

The NRC staff also reviewed why the combined LOCA/LOOP test has to be performed on one division at a time. In its supplemental response dated February 28, 2006, PPL stated that the LOCA/LOOP test has always been performed on a divisional bases since some divisional safety-related equipment is also energized from the Channel C and D ESS buses. Examples such as Residual Heat Removal Service Water and Control Structure Chillers, which are divisional systems, are fed from the Unit 1C and the Unit 1D ESS Buses. The current procedure assures that the LOCA/LOOP test satisfies the requirements to demonstrate operability of the channelized and divisionalized loads under LOCA/LOOP conditions, and reduces the time that the plant would be in an LCO condition. This surveillance allows the entire division to be tested and assures that the divisional support equipment is energized to support the ECCS functions.

The NRC staff also requested PPL to address the compensatory measures that will be taken when the LOCA/LOOP test is being performed. PPL indicated that during the LOCA/LOOP test, plant procedures and outage work management restrict maintenance activities on the Unit 1 division that is affected by the test, which ensures the redundant Unit 1 division is operable. If it were necessary to perform emergent maintenance/repair work on Unit 2 equipment, the risk of performing this work would be evaluated under the Maintenance Rule Program, and the necessary compensatory measures identified by the risk evaluation would be put into place. PPL also indicated that work on the transmission system directly affecting the offsite source to SSES 1 and 2 will be controlled and reviewed, and that communications will be established with the Pennsylvania New Jersey Maryland (PJM) Energy Management System in accordance with the applicable PJM procedures to ensure grid stability.

The NRC staff confirmed that there is assurance that sufficient equipment is available to support mitigation of accident conditions on Unit 2 during the performance of TS SR 3.8.1.19 for Unit 1. The AC electrical equipment of all four Unit 2 4.16 kV ESS buses (both divisions) and for the Unit 2 required portions of the two remaining Unit 1 4.16 kV ESS buses are sufficient to support accident mitigation and the subsequent safe shutdown of Unit 2. The performance of SR 3.8.1.19 will momentarily deenergize one Unit 1 division (two subsystems) of AC electrical power distribution subsystems. The remaining AC electrical power distribution subsystems required by SSES 2 TS 3.8.7 are sufficient to support the assumed accident mitigation and subsequent safe shutdown of Unit 2. On this basis, the NRC staff concludes that the proposed change to TS 3.3.8.1 is acceptable.

3.4 Proposed Change to TS 3.8.7, Condition C

During the conversion to Improved TSs, the phrase, "or more," was added to SSES 2 TS 3.8.7, Condition C. PPL stated that it could not find a discussion or purpose for the words "or more" in any internal documents or any documents sent to the NRC staff. The NRC staff finds that the removal of this phrase is administrative; therefore, the subject change is acceptable.

3.5 Proposed Change to TS 3.8.7

PPL proposed to add a new Condition D to TS 3.8.7, which will apply to a single Unit 1 division (which comprises two subsystems). This TS will be in effect only during testing required by Unit 1 TS SR 3.8.1.19. This new condition will impose an 8-hour completion time for restoration of at least one of the two Unit 1 AC distribution subsystems.

PPL indicated that SR 3.8.1.19 for Unit 1 is performed when Unit 1 is shutdown and Unit 2 is at power. Since certain common loads (ESW, SGTS, and HVAC) required for Unit 2 operation are supplied by Unit 1 4.16 kV ESS buses only, the Unit 1 surveillance test affects the availability of one division of required loads for Unit 2 while it is at power. SSES 2 TS 3.8.7 requires that various Unit 1 AC electrical power distribution subsystems remain energized to support required Unit 2 equipment; and Action C allows only one subsystem to be deenergized. Since the test required by Unit 1 SR 3.8.1.19 effectively deenergizes two Unit 1 AC distribution subsystems (i.e. one division), SSES 2 TS LCO 3.8.7 is not met. Since Action C of SSES 2 TS 3.8.7 allows one Unit 1 AC distribution subsystem to be deenergized, Unit 2 entry into LCO 3.0.3 is required.

PPL also indicated that performance of Unit 1 SR 3.8.1.19 deenergizes both AC electrical power distribution subsystems of one division because the surveillance is also a partial functional test of other systems. When performing Unit 1 SR 3.8.1.19, it is necessary to block the automatic transfer from the normal to the alternate offsite power supply for the two Unit 1 4kV buses in the same division being tested before deenergizing them for the surveillance. Blocking the automatic transfer disables two Unit 1 AC subsystems at a time when they are required to be operable to support Unit 2 operation. Sufficient equipment is available during the Unit 1 performance of SR 3.8.1.19 to support mitigation of accident conditions in Unit 2. The resulting combination of all four Unit 2 AC distribution subsystems (both divisions) and the Unit 2 parts of the two remaining Unit 1 distribution subsystems is sufficient to support accident mitigation and the subsequent safe shutdown of Unit 2. Additionally, performance of the Unit 1 test does not preclude any EDG from being able to support the associated Unit 2 AC distribution subsystem.

In its March 18, 2005, submittal, PPL states that the diesels are fully loaded to support the Unit 1 testing for approximately 1 hour, meeting the 5 minute fully loaded period requirement for performing TS SR 3.8.1.19. If a design basis LOCA and LOOP occur on Unit 2 during this test, the operator is directed to take manual compensatory actions. PPL also states in its submittal that these operator actions have been addressed in the corresponding test procedure. The operator will take immediate action to shed nonessential loads from the Unit 1 loaded diesels to prepare the diesels for the accident loads via the load sequence timers in Unit 2. If only a LOOP event occurs to one or both units during the Unit 1 tests, the AC distribution subsystems not associated with the tested subsystems will be capable of supporting the minimum safety functions necessary to shutdown the reactors and maintain them in a safe shutdown condition. Therefore, the required AC buses must be restored to operable status within a relatively short period of time. The 8-hour completion time (Required Action A.1) balances the benefit of performing the required test with the low probability of a LOOP or a LOCA with a LOOP while one division in Unit 1 is inoperable for the duration of the test.

The NRC staff reviewed the completion time difference between having one or more Unit 2 load groups (8 hours) out of service and having one Unit 1 (72 hours) load group out of service. PPL stated that the 8-hour completion time to restore Unit 2 load group(s) (provided there is no loss of safety function) is consistent with the completion times stated in NUREG-1433, "Standard Technical Specifications General Electric Plants, BWR/4." NUREG-1433 justified the completion time on the basis that the remaining AC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shutdown the reactor and maintain it in a safe shutdown condition, assuming no single failure. The overall reliability is reduced, however, because a single failure in the remaining power distribution subsystems could result in the minimum required engineered safety feature functions not being supported. Therefore, the required AC buses, load centers, motor control centers, and distribution panels must be restored to OPERABLE status within 8 hours. As stated in the SSES 2 TS Bases, the completion time of 72 hours for the loss of one Unit 1 AC load group is consistent with the completion times associated with LCOs for the Unit 2 and common equipment affected by loss of a Unit 1 AC load group. The equipment affected by the loss of a Unit 1 AC load group is ESW, SGTS, or Control Structure HVAC (Control Room Emergency Outside Air Supply). The loss of one Unit 1 ac load group does not cause a loss of safety function. The LCO completion times for the affected common equipment are equal to or greater than 7 days: therefore, the 72-hour completion time is conservative with respect to the individual LCO times.

Based on its review of the information provided by PPL, the NRC staff concludes that (1) sufficient equipment is available to support mitigation of an accident on Unit 2 during the performance of SR 3.8.1.19 for Unit 1 during shutdown, (2) the 8-hour required completion time balances the benefit of performing the required test with the low probability of a LOOP or a LOCA with a LOOP while one division in Unit 1 is inoperable for the duration of the test. Therefore, the NRC staff finds the proposed TS changes to TS 3.8.7 in Unit 2 acceptable.

3.6 Conclusion

Based upon the above evaluation, the NRC staff finds that: (1) there is reasonable assurance that sufficient equipment is available to support mitigation of accident condition in Unit 2 during the performance of Unit 1 SR 3.8.1.19, (2) the 8 hour required completion time balances the benefit of performing the required test with the low probability of a LOOP or a LOOP/LOCA while one division in Unit 1 is inoperable for the duration of the test, (3) compensatory measures would ensure the availability of the remaining sources of AC power and electrical power distribution system during performance of Unit 1 SR 3.8.1.19. Therefore, the proposed TS changes are acceptable. The NRC staff also concludes that the proposed changes will not affect PPL's compliance with requirements of GDC 17 and 18.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (70 FR 29800). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: D. Nguyen

Date: March 16, 2006