

DOCKETED

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CALIFORNIA ENERGY COMMISSION

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DATE: December 12, 2014

TO: Interested Parties

FROM: Camille Remy Obad, Compliance Project Manager

**SUBJECT: El Segundo Energy Center Project (00-AFC-14C)
Staff Analysis of Proposed Modifications to Air Quality Conditions of Certification**

On October 3, 2014, the project owner, El Segundo Energy Center, L.L.C. (ESEC LLC) filed a petition with the California Energy Commission (Energy Commission) requesting modification of four air quality conditions of certification contained within the Final Decision for the El Segundo Energy Center (ESEC). The Energy Commission approved the ESEC's conversion to a 560-megawatt (MW) rapid response combined-cycle natural gas power generation facility using dry-cooling and zero liquid discharge technology on June 30, 2010. The ESEC's Units 5 & 7 have been operational since August 1, 2013, and are located at 301 Vista Del Mar, El Segundo, California, approximately two miles south of the Los Angeles International Airport in Los Angeles County.

This Petition to Amend (PTA) requests the Energy Commission to address how aborted startups and associated turbine restarts are counted toward the annual 200 start-up limit for ESEC's Units 5 & 7. This startup/restart clarification language will also be reflected in the South Coast Air Quality Management District's (Air District's) errata to the Final Determination of Compliance (FDOC) for Units 9 through 12 currently under review by the Energy Commission in a separate PTA.

The Unit 5 & 7 PTA originally requested clarifying language for Air Quality (AQ) Conditions of Certification **AQ-16, AQ-17, AQ-20, and AQ-32** only. On November 25, 2014, the Air District provided the Energy Commission's technical staff with the startup/restart clarification language. The Air District also made additional administrative changes to other conditions, most of which are related to commissioning, initial operation and initial testing. Staff analyzed these additional changes as well. The Unit 5 & 7 analysis enclosed for your review now includes modifications to Air Quality Conditions of Certification **AQ-5, AQ-7, AQ-11, AQ-14 through AQ-17, AQ-20, AQ-32, AQ-36, and AQ-37**, and recommends deletion of **AQ-6, AQ-18, AQ-19, AQ-27, AQ-35 and AQ-40**.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for Air Quality. It is staff's opinion that, with the

implementation of revised conditions, the project will remain in compliance with all applicable laws, ordinances, regulations, and standards (LORS) and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis are posted on the Energy Commission's webpage at <http://www.energy.ca.gov/sitingcases/ElSegundo/compliance/index.html>. The Energy Commission's Order will also be posted on the webpage if the petition to amend is approved. Energy Commission staff intends to recommend approval of the petition at the January 14, 2015, Business Meeting of the Energy Commission. If you have any questions, please contact Camille Remy Obad, Compliance Project Manager, at (916) 654-3940, or by fax to (916) 654-3882, or via e-mail at: cremyoba@energy.ca.gov.

Agencies and members of the public who wish to provide comments on the amendment petition or staff's analysis must submit their comments by **January 12, 2015**, using the Energy Commission's e-commenting feature by going to the Energy Commission's El Segundo Energy Center webpage <https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=00-AFC-14C>, and clicking on the "Submit e-Comment" link. A full name, e-mail address, comment title, and either a comment or an attached document (in the .doc, .docx, or .pdf format) are mandatory. After entering CAPTCHA (a challenge-response test used by the system to ensure that responses are generated by a human user and not a computer), click on the "Agree & Submit Your comment" button to submit the comment to the Energy Commission Dockets Unit. Written comments may also be mailed or hand delivered to:

California Energy Commission
Dockets Unit, MS-4
Docket No. (00-AFC-14C)
1516 Ninth Street
Sacramento, CA 95814-5512

All comments and materials filed with the Dockets Unit will become part of the public record of the proceeding.

For further information on how to participate in this proceeding, please contact the Energy Commission Public Adviser's Office, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail at publicadviser@energy.state.ca.us. News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at mediaoffice@energy.state.ca.us.

Enclosure

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STAFF ANALYSIS

EL SEGUNDO ENERGY CENTER PROJECT

PETITION TO AMEND AIR QUALITY CONDITIONS OF CERTIFICATION FOR UNITS 5&7

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EL SEGUNDO ENERGY CENTER PROJECT (00-AFC-14C)
PETITION TO AMEND ENERGY COMMISSION DECISION
EXECUTIVE SUMMARY

Prepared by Camille Remy Obad

INTRODUCTION

The project site is located on the coast of the Pacific Ocean, near El Segundo's southernmost city limit, between Dockweiler State Beach and the city of Manhattan Beach, in Los Angeles County. The Energy Commission first certified the original 630-megawatt El Segundo Redevelopment Project facility on February 2, 2005. Subsequent amendments approved on June 30, 2010 and August 9, 2012 respectively, began its conversion to a nominal 560-megawatt rapid response combined-cycle facility using dry cooling and zero liquid discharge technology, and changed the facility's name to the El Segundo Energy Center (ESEC).

On April 23, 2013, the project owner submitted an amendment request, entitled the El Segundo Power Facility Modification (ESPFM) project, to replace the once-through seawater cooling system with dry-cooling technology. The ESPFM proposes replacing Boilers 3 and 4 with one new combustion turbine generator (Unit 9) and one steam turbine generator (Unit 10), operating as a combined cycle, and two simple-cycle gas turbines (Units 11 and 12) totaling 449 megawatts. With completion of the ESPFM, the total generating capacity of the ESEC will be 1,022 megawatts gross. Staff published the Final Staff Assessment (FSA) Part A for ESPFM on October 6, 2014. FSA Part A contained all technical sections except the Air Quality (AQ) and greenhouse gas (GHG) analysis which will be published in the subsequent FSA Part B.

On October 3, 2014, ESEC, LLC filed this separate amendment request to the Energy Commission to address how aborted startups and associated turbine restarts are counted toward the annual 200 start-up per unit limit for Units 5 & 7. This startup/restart clarification language must also be reflected in the Air District's errata to the Final Determination of Compliance (FDOC). The FDOC for Units 9 through 12 was originally released in August 2014. Since Units 5 & 7 are already operating, the project owner requested that the Energy Commission and the Air District give the Units 5 & 7 startup/restart petition priority over their prior request for changes to the FDOC for the ESPFM's proposed new Units 9, 10, 11 and 12 (to be analyzed as FSA Part B).

The Unit 5 & 7 PTA originally requested clarifying language for AQ Conditions of Certification **AQ-16**, **AQ-17**, **AQ-20**, and **AQ-32** only. On November 25, 2014, the Air District provided the Energy Commission's AQ technical staff with the startup/restart clarification language. The Air District also made additional administrative changes to other conditions, most of which are related to commissioning, initial operation and initial testing. Staff analyzed these additional changes as well. The Unit 5 & 7 analysis enclosed for your review now includes modifications to Air Quality Conditions of Certification **AQ-5**, **AQ-7**, **AQ-11**, **AQ-**

14 through **AQ-17, AQ-20, AQ-32, AQ-36, and AQ-37**, and recommends deletion of **AQ-6, AQ-18, AQ-19, AQ-27, AQ-35 and AQ-40**.

The purpose of the Energy Commission's review process is to assess any impacts the proposed modifications would have on environmental quality and public health and safety. The process includes an evaluation of the consistency of the proposed changes with the Energy Commission's Decision (Decision), and if the project, as modified, will remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (Title 20, Calif. Code of Regulations, section 1769).

This Staff Analysis contains the Energy Commission staff's evaluation of the affected technical area of Air Quality.

DESCRIPTION OF PROPOSED MODIFICATIONS

The modifications proposed in the petition are based on the need to define and clarify turbine start-up/restart events as well as amending or removing AQ conditions of certification pertaining to commissioning, initial operation and initial testing activities.

The proposed modifications include:

1. Changing **AQ-5, AQ-7, AQ-11, AQ-14 through AQ-17, AQ-20, AQ-32, AQ-36, and AQ-37**; and
2. Eliminating **AQ-6, AQ-18, AQ-19, AQ-27, AQ-35 and AQ-40**.

NECESSITY FOR THE PROPOSED MODIFICATIONS

ESEC's Units 5 & 7 are natural gas fired combustion turbines. Occasionally, aborted startups of these turbines occur due to system upsets. This results in the startup, shutdown, and restart of a unit. ESEC's AQ conditions certification do not address how these startup/restarts should be counted for purposes of tracking compliance with the annual 200 start limit for each unit. This creates ambiguities regarding the ability to operate ESEC as required by their conditions of certification.

To address how these startup/restart occurrences should be counted, ESEC LLC initially requested clarifying language be added to the Air District's Title V Permit Conditions A99.7, A99.8, A99.9 and A433.1, respectively, and also to the Energy Commission's AQ Conditions of Certification **AQ-16, AQ-17, AQ-20, and AQ-32**. Subsequently the Air District proposed changes that also affected **AQ-5, AQ-7, AQ-11, AQ-14, AQ-15, AQ-36 and AQ-37**, and facilitated the deletion of **AQ-6, AQ-18, AQ-19, AQ-27, AQ-35 and AQ-40**.

The proposed changes to these conditions of certification, and the corresponding Air District permit conditions, will not affect the ESEC's emission limits nor the 60-minute startup duration specified in the conditions of certification.

STAFF'S ASSESSMENT OF THE PROPOSED PROJECT CHANGES

The technical areas contained in this Staff Analysis indicate recommended staff changes to the original and amended Decisions and conditions of certification. Staff believes that by requiring the proposed changes to the existing conditions, the potential impacts of the proposed changes would be reduced to less than significant levels. A summary of staff's conclusions reached in each technical area are summarized in the following table. The details of the proposed condition changes can be found under the appropriate technical heading (Air Quality) in this Staff Analysis.

Energy Commission technical staff reviewed the Units 5 & 7 PTA for potential environmental effects and consistency with applicable LORS. Staff has determined that the technical or environmental areas of Biological Resources, Cultural Resources, Facility design, Geological and Paleontological Resources, Land Use, Public Health, Noise and Vibration, Socioeconomics, Soil and Water Resources, Traffic and Transportation, Transmission Line Safety and Nuisance, Transmission System Engineering, Visual Resources, Waste Management, and Worker Safety and Fire Protection are not affected by the proposed changes, and no revisions or new conditions of certification are needed to ensure the project remains in compliance with all applicable LORS and existing conditions of certification in the Decision.

Staff has determined that the technical area of Air Quality for Units 5 & 7 would be affected by the proposed project changes and have proposed or revised conditions of certification in order to assure LORS compliance and/or to reduce potential environmental impacts to a less than significant level.

EXECUTIVE SUMMARY Table 1
Summary of Technical Area Response to Petition

TECHNICAL AREAS REVIEWED	STAFF RESPONSE	
	Technical Area Not Affected	Process As Amendment*
Air Quality		X
Biological Resources	X	
Cultural Resources	X	
Geological Hazards & Resources	X	
Hazardous Materials Management	X	
Facility Design	X	
Land Use	X	
Noise and Vibration	X	
Paleontological Resources	X	
Public Health	X	
Socioeconomics	X	
Soil and Water Resources	X	

Traffic and Transportation	X	
Transmission Line Safety & Nuisance	X	
Transmission System Engineering	X	
Visual Resources	X	
Waste Management	X	
Worker Safety and Fire Protection	X	

* New or revised conditions of certification recommended by staff

STAFF RECOMMENDATIONS AND CONCLUSIONS

Staff concludes that, with the implementation of revised and new conditions of certification, the following required findings mandated by Title 20, section 1769(a)(3) of the California Code of Regulations can be made, and staff will recommend approval of the petition to the Energy Commission:

- A. There will be no new or additional unmitigated significant environmental impacts associated with the proposed changes;
- B. The facility will remain in compliance with all applicable laws, ordinances, regulations and standards;
- C. The proposed changes will be beneficial to the project owner and the public as they clarify the regulatory language that defines a turbine start-up/restart as well as commissioning, initial operation and initial testing activities. Such clarification allows all parties to agree on the applicable regulatory definitions and ensures that the ESEC continues to operate in compliance with its applicable AQ conditions of certification.
- D. There has been a substantial change in circumstances since the Energy Commission certification justifying the changes since turbine starts/restarts were not previously defined and some conditions of certification are no longer required.

El Segundo Energy Center Project (00-AFC-14C)
Amend Air Quality Conditions of Certification for Units 5&7 Startups and Restarts
Wenjun Qian, Ph.D., P.E.

SUMMARY OF CONCLUSIONS

Staff finds that with the adoption of the attached conditions of certification, the modified El Segundo Energy Center Project (project) would continue to comply with applicable federal, state, and South Coast Air Quality Management District (SCAQMD or District) air quality laws, ordinances, regulations and standards (LORS). The proposed modifications would not result in significant air quality or Greenhouse Gas (GHG) related impacts. There are no air quality environmental justice issues related to this amendment request and no minority or low-income populations would be significantly or adversely impacted.

INTRODUCTION

The El Segundo Power Redevelopment Project (ESPRP) was originally certified to be 630 megawatts (MW) by the Energy Commission on February 2, 2005 (CEC 2005). In June 2010, the Energy Commission approved an amendment to replace the approved turbines and once-through cooling system with a rapid response combined cycle (R2C2) design and dry-cooling, changing the nominal plant capacity from 630 MW to 560 MW (CEC 2010b). In August 2012, the Energy Commission approved a petition to change the project name from El Segundo Power Redevelopment Project to El Segundo Energy Center Project, as well as to modify the range of ammonia injection rates and eliminate a venturi scrubber (CEC 2012). The approved El Segundo Energy Center Project (ESEC) began commercial operation in the third quarter of 2013.

On April 23, 2013, the El Segundo Energy Center, LLC (facility owner) submitted an amendment request to the Energy Commission that would replace Boilers 3 and 4 with one new GE 7FA combustion turbine generator (Unit 9) and one steam turbine generator (Unit 10), operating as a combined cycle, and two Rolls Royce Trent 60 simple-cycle gas turbines (Units 11 and 12), known as the El Segundo Power Facility Modification (ESPFM) project (NRG 2013). Staff has published the Final Staff Assessment (FSA) Part A (CEC 2014) for this amendment request that contained all technical sections with the exception of Air Quality which will be published in a subsequent FSA Part B.

On October 3, 2014, the Energy Commission received an amendment request from the facility owner that would add clarifying language to Air Quality Conditions of Certification **AQ-16**, **AQ-17**, **AQ-20**, and **AQ-32** regarding startups and restarts for Units 5 and 7 of ESEC (ESEC 2014b). The District has reviewed the proposed changes. On November 25, 2014, the District revised the Permit to Operate for ESEC to incorporate the proposed startup language for Units 5 and 7. The District also made additional administrative changes to other conditions, most of which are related to commissioning,

initial operation and initial testing (SCAQMD 2014b). Staff will consider these additional changes.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The 2005 Commission Decision (CEC 2005), the 2010 Commission Decision to the Amendment (CEC 2010b) and the 2012 Commission Order (CEC 2012) concluded the project complied with all applicable federal, state, and SCAQMD air quality laws, ordinances, regulations and standards (LORS). Staff has not identified additional applicable LORS relative to the current amendment petition.

ANALYSIS

Startup language

Air Quality Conditions of Certification **AQ-16, AQ-17, AQ-20, and AQ-32** currently specify that ESEC Units 5 and 7 are limited to 200 startups per unit per year. Based on actual operating experience over the past several months, the facility owner found that aborted startups occur periodically due to system upsets. This results in startup, shutdown, and restart events. The facility owner initially estimated approximately 10 startup/restart events per unit have occurred in 2014 with an expectation of 15 events per unit per year based on proration. However, based on further review of actual startups for the period from January 1, 2014 to October 15, 2014, the facility owner found Unit 5 experienced only four startup/restart events and Unit 7 experienced only two startup/restart events over that time period (ESEC 2014c). Air Quality conditions of certification as currently written do not address how these startup/restarts should be treated in terms of compliance with the 200 startups per year limit.

To address how these startup/restart occurrences should be counted, the facility owner requests that clarifying language be added to the Conditions of Certification **AQ-16, AQ-17, AQ-20, and AQ-32**. The proposed language would clarify that *“if during startup, the process is aborted and the startup is restarted, then the startup and restart will count as one startup. In this case, the startup time shall not exceed 60 minutes.”* Similar language was included in the Commission Decision for CPV Sentinel Energy Center (CEC 2010c).

The facility owner states that the proposed changes to Conditions of Certification **AQ-16, AQ-17, AQ-20, and AQ-32** would not affect the emission limits on Units 5 and 7. The facility owner provided detailed Continuous Emissions Monitoring Systems (CEMS) data during all the six startup/restart events (four for Unit 5 and two for Unit 7) that occurred in 2014. The worst case hourly oxides of nitrogen (NO_x) emission rate of 55 pounds per hour (lbs/hr) during the 2014 startup/restart events was lower than the annually adjusted startup allowable hourly NO_x emission rate of 56.03 lbs/hr shown in the District’s May 2010 Second Addendum to the Determination of Compliance (SCAQMD 2010), which is also well below the worst case hourly NO_x emission rate of 91.1 lbs/hr for the startup/shutdown case analyzed for modeling purposes in the 2007 permit application package for the project (NRG 2007). The worst-case hourly carbon

monoxide (CO) emission rate of 872 lbs/hr is somewhat above the worst case short-term CO emission level of 823.3 lbs/hr for the startup/shutdown case analyzed for modeling purposes in the 2007 permit application package for the project. However, this emission rate is well below the maximum hourly CO emission rate of 3,812.6 lbs/hr for the commissioning phase of the project that was also analyzed for modeling purposes in the 2007 permit application package. The worst case short-term CO modeling results for the commissioning phase in the 2007 permit application package, which are also reflected in the 2010 Revised Staff Analysis (CEC 2010a), show that the maximum impacts are well below the most stringent ambient air quality standards for CO. The facility owner does not expect a change to maximum allowable NO_x and CO emissions during the startup/restart events. In addition, the facility owner does not anticipate a change to maximum allowable VOC emissions either since VOC emissions during startups are typically assumed to roughly track CO emissions.

The facility owner also showed that the total actual emissions for 2014, summed to the day before the submission of the petition to the District in September 2014, are only approximately 20 percent of the maximum allowable annual emission levels analyzed during the permitting of Units 5 and 7. Given that there were only approximately 4 months remaining in the current compliance year, the facility owner expects that the final annual emissions for each unit would be well below the maximum levels analyzed during the permitting of Units 5 and 7.

Conditions of Certification **AQ-16**, **AQ-17**, **AQ-20**, and **AQ-32** also limit the startup time to no more than 60 minutes. However, the approved conditions of certification for Units 5 and 7 do not include a definition of the term startup. In the August 26, 2014 Final Determination of Compliance (FDOC) for the El Segundo Power Facility Modification Project (SCAQMD 2014a), the District defined the beginning of startup to be the initial fire of fuel in the combustor and the end of startup to be the time when the Best Available Control Technology (BACT) levels are achieved. The facility owner proposes to apply this same definition for Units 5 and 7. The District agreed and added the definition in the revised Permit to Operate for ESEC (SCAQMD 2014b).

The facility owner expects a typical startup/restart event to occur within 60 minutes. The CEMS data provided by the facility owner show that for five of the six startup/restart events, the duration from the beginning of the initial startup to the time when the NO_x/CO BACT levels were achieved following the restart ranged from 35 to 46 minutes. For the sixth event occurred on September 23, 2014 for Unit 7, the duration was 88 minutes due to extended (47-minute) purging between the end of the initial startup attempt and initiation of the restart. The facility owner requested that the startup/restart event of Unit 7 on September 23 be treated as a single startup. After consulting with the District, staff believes startup/restart events exceeding 60 minutes shall not be counted as a single startup because of the 60-minute limit imposed in Conditions of Certification **AQ-16**, **AQ-17**, **AQ-20**, and **AQ-32**.

The proposed startup language does not change the number of startups allowed per year (200 startups per year per turbine) or the duration of each startup (60 minutes) and

thus would not affect the annual fuel use or the GHG emission profiles of Units 5 and 7. Staff believes the proposed changes in the conditions of certification would not result in GHG impacts that are cumulatively significant.

There are no air quality environmental justice issues related to this amendment request and no minority or low-income populations would be significantly or adversely impacted.

Administrative changes

In addition to the startup language, the District also made administrative changes to other conditions, most of which are related to commissioning, initial operation and testing. The proposed administrative changes would not cause significant Air Quality or GHG impacts. Staff recommends including the changes in the conditions of certification, and shows the changes below.

Air Quality Table 1 maps out the relationship between Energy Commission condition numbering and District condition numbering and proposed modifications and justification for changes to each condition. Staff has only included the conditions of certification for Units 5 and 7 that need changes in this document. The facility owner proposed to include the same clarifying language regarding startups and restarts in the conditions of certification for the proposed new ESEC Units 9-12. A complete set of all the AQ conditions of certification applicable to the whole facility, including those for Units 5 and 7 and those proposed for the new ESEC Units 9-12, will be included in the Air Quality section of the FSA Part B for the ESPFM project. In addition, a compendium of all the conditions of certification for all the technical areas discussed in FSA Part A will also be included in FSA Part B.

**Air Quality Table 1
Air Quality Conditions of Certification (COCs)
with Proposed Modifications and Justification**

Energy Commission Numbering	District Numbering	Proposed Modifications and Justification
AQ-5	D29.8	The District deleted language regarding testing requirements during the first twelve months of operation because Units 5 and 7 have been in operation for more than twelve months. Staff agrees.
AQ-6	D29.7	The District deleted this condition because it applies to initial source testing which was completed. Staff agrees.
AQ-7	D29.9	The District added periodic source testing requirement for PM2.5 for information purposes and to establish appropriate reporting factors. Staff agrees. Staff also corrected a typographical error in the Energy Commission approved AQ-7 regarding the

Energy Commission Numbering	District Numbering	Proposed Modifications and Justification
		allowable concentration of the total hydrocarbon contained in zero gas used for the VOC compliance test.
AQ-11	A63.2	The District updated the SO _x emission factor to correct the rounding error. Staff agrees.
AQ-14	D82.4	The District deleted the language regarding installation and initial operation of the CO CEMS because these events were completed. Staff agrees.
AQ-15	D82.5	The District deleted the language regarding installation and initial operation of the NO _x CEMS because these events were completed. Staff agrees.
AQ-16	A99.7	As requested by the facility owner, the District added a definition for startup and clarifying language regarding startups and restarts. The District also deleted language related to commissioning period, which was completed. Staff agrees.
AQ-17	A99.8	As requested by the facility owner, the District added a definition for startup and clarifying language regarding startups and restarts. The District also deleted language related to commissioning period, which was completed. Staff agrees.
AQ-18	A99.10	The District deleted this condition because it applies to the interim reporting period during initial turbine commissioning, which was completed. Staff agrees.
AQ-19	A99.11	The District deleted this condition because it applies to the interim reporting period after initial turbine commissioning, which should not exceed 12 months from entry into Regional Clean Air Incentives Market (RECLAIM). Staff agrees.
AQ-20	A433.1	As requested by the facility owner, the District added a definition for startup and clarifying language regarding startups and restarts. Staff agrees.
AQ-27	I296.2	On June 3, 2011, the SCAQMD Governing Board amended Rule 2005 and removed the requirement for existing facilities to hold RECLAIM Trading Credits (RTCs) after the

Energy Commission Numbering	District Numbering	Proposed Modifications and Justification
		<p>first year of operation. This applies to existing facilities, such as El Segundo Energy Center, that do not have emissions greater than the level of their 1994 allocation plus Non-Tradable Credits (NTCs). Such existing facilities are only subject to the “hold” requirement for the first year of operation of each source with an emissions increase. In addition, SCAQMD changed its existing New Source Review (NSR) hold policy to require a separate NSR hold condition for each individual piece of equipment rather than a single NSR hold condition for the entire facility. Therefore, beginning in the 2013 compliance year, the District reissued the permit to reflect the requirements of the amended Rule 2005 and NSR hold policy. The District replaced condition I296.2 (a single condition for RTC requirements for Units 5 and 7) with two conditions I297.1 and I297.2, which specified RTC requirements for Units 5 and 7 respectively. The requirement to hold RTCs after the first year of operation is no longer applicable and was deleted from the permit. Also, since the first year of operation has passed, conditions I297.1 and I297.2 are no longer applicable and the District deleted them in the revised Permit to Operate. Staff proposes to delete Condition of Certification AQ-27.</p>
AQ-32	A99.9	<p>As requested by the facility owner, the District added a definition for startup and clarifying language regarding startups and restarts. The District also deleted language related to commissioning period, which was completed. Staff agrees.</p>
AQ-35	C1.6	<p>The District deleted this condition because the monthly limit on gas usage was originally placed on the turbines during the original Application for Certification (AFC) for El Segundo Power Redevelopment Project, which proposed an increase in capacity over</p>

Energy Commission Numbering	District Numbering	Proposed Modifications and Justification
		<p>the shutdown capacity from Boilers 1 and 2. With the 2010 Commission Decision approving the rapid response combined cycle (R2C2) technology, dry cooling, and the shutdown of Boiler 3, the revised El Segundo Power Redevelopment Project was fully offset on the Rule 1303 megawatt (MW) to MW basis. In addition, the 2010 Commission Decision established Condition of Certification AQ-11 (District condition A63.2) which covered monthly mass emissions under Rules 1303 and 1313. Thus, Condition of Certification AQ-35 (District condition C1.6) is no longer valid and should be deleted.</p>
AQ-36	K67.5	<p>The District deleted the language regarding natural gas fuel use during the commissioning period and during the period after the commissioning period but prior to CEMS certification because the commissioning period was completed and the District certified the CEMS for Units 5 and 7 in August 2013. Staff agrees.</p>
AQ-37	F2.1	<p>As requested by the facility owner in the comment letter to the District on the Final Determination of Compliance (FDOC) for Units 9-12 (ESEC 2014a), the District added the emission factors for Boiler 4 and Units 5 and 7 to assist the calculation of the annual PM2.5 emissions. Staff agrees.</p>
AQ-40	E193.3	<p>The District deleted this condition which limits operation of Units 5 and 7 simultaneously with Boilers 1, 2, or 3 during initial operation of Units 5 and 7. This condition also requires the facility owner to surrender the Permit to Operate for Boiler 3 within 90 days of the start-up of the Units 5 and 7. Since Boilers 1 and 2 were demolished and the Permit to Operate for Boiler 3 was surrendered, this condition is obsolete and should be deleted.</p>

CONCLUSIONS AND RECOMMENDATIONS

The proposed modifications in the conditions of certification would not affect the project's ability to continue to comply with applicable federal, state, and SCAQMD air quality laws, ordinances, regulations, and standards (LORS). The proposed modifications would not cause significant air quality or GHG impacts. Therefore, there are no air quality environmental justice issues related to this amendment request and no minority or low-income populations would be significantly or adversely impacted. Staff recommends that the revised conditions of certification be approved as shown below.

PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

Below is a list of those Conditions of Certification that staff recommends be revised from those in effect as of the 2010 Commission Decision to the Amendment (CEC 2010b). ~~Strikethrough~~ is used to indicate deleted language and **underline and bold** is used for new language. A complete set of all the conditions of certification applicable to the whole facility, including those for Units 5 and 7 and those proposed for the new ESEC Units 9-12, will be included in the Air Quality section of the FSA Part B for the ESPFM project.

AQ-5 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutants to be Tested	Test Method	Averaging Time	Test Location
NH ₃ Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

The test shall be conducted and the results submitted to the District within 45 days after the test date. The District shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted ~~at least quarterly during the first twelve months of operation and at least annually thereafter.~~ The NO_x concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NO_x emissions using District Method 100.1 measured over a 60 minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 **BACT** concentration limit.

If the equipment is not operated in any given quarter, the operator may elect to defer the required testing to a quarter in which the equipment is operated.

For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and CPM.

Verification: The project owner shall submit the proposed protocol for the source tests no later than 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-6 [Deleted]

The operator shall conduct source test(s) for the pollutant(s) identified below on combined cycle turbine units 5 and 7.

Pollutants To be Tested	Required Test Method	Averaging Time	Test Location
NOx Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
CO Emissions	District Method 100.1	1 hour	Outlet of SCR serving this equipment
SOx Emissions	District Method 307-91	N/A	Fuel Sample
VOC Emissions	District Method 25.3	1 hour	Outlet of SCR serving this equipment
PM10 Emissions	District Method 5	4 hours	Outlet of SCR serving this equipment
NH3 Emissions	District Method 207.1 and 5.3 or EPA Method 17	1 hour	Outlet of SCR serving this equipment

~~The test shall be conducted after District and CPM approval of the source test protocol, but no later than 180 days after initial start-up. The District and CPM shall be notified of the date and time of the test at least 10 days prior to the test.~~

~~The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.~~

~~The test shall be conducted in accordance with a District and CPM approved source test protocol. The protocol shall be submitted to the District and the CPM no later than 45 days before the proposed test date and shall be approved by the District and CEC before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of District Rule 304, and a description of all sampling and analytical procedures.~~

~~The test shall be conducted when this equipment is operating at maximum, average and minimum loads.~~

~~The test shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.~~

~~For natural gas-fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters is done with zero gas analyzed/certified to contain less than 0.5 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA method TO-12 (with preconcentration) and temperature of canisters when extracting samples for analysis is not below 70 deg. F. The use of this alternative method for VOC compliance determination does not mean that it is more accurate than District method 25.3, nor does it mean that it may be used in lieu of District method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas-fired turbines. The test results shall be reported with two significant digits.~~

~~For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and GPM.~~

~~**Verification:** The project owner shall submit the proposed protocol for the initial source tests no later than 45 days prior to the proposed source test date to both the District and GPM for approval. The project owner shall submit source test results no later than 60 days following the source test date to both the District and GPM. The project owner shall notify the District and GPM no later than 10 days prior to the proposed initial source test date and time.~~

AQ-7 The operator shall conduct source test(s) for the pollutant(s) identified below on combined d cycle turbine units Units 5 and 7.

Pollutants to be Tested	Required Test Method(s)	Averaging Time	Test Location
SOx Emissions	AQMD Method 307-91	N/A	Fuel Sample
VOC Emissions	District Method 25.3	1 hour	Outlet of SCR serving this equipment
PM ₁₀ Emissions	District Method 5	4 hours	Outlet of SCR serving this equipment
<u>PM_{2.5} Emissions</u>	<u>EPA Method 201A and 202</u>	<u>District-approved averaging time</u>	<u>Outlet of SCR serving this equipment</u>

The tests shall be conducted at least once every three years for SOx, **PM_{2.5}** and **PM₁₀**, and annually for VOC.

The test(s) shall be conducted to determine the oxygen levels in the exhaust. In addition, the test(s) shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in megawatts (MW).

The test(s) shall be conducted in accordance with District- approved test protocol. The protocol shall be submitted to the District and the CPM no later than 45 days before the proposed test date and shall be approved by the District and the ~~CEC~~-CPM before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at 100 percent load.

The test(s) shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas-fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters is done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA method TO-12 (with preconcentration) and temperature of canisters when extracting samples for analysis is not below 70 deg. F. The use of this alternative method for VOC compliance determination does not mean that it is more accurate than District method 25.3, nor does it mean that it may be used in lieu of District method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines. The test results shall be reported with two significant digits.

For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the District, EPA and CPM.

Verification: The project owner shall submit the proposed protocol for the source tests no later than 45 days prior to the proposed source test date to both the District and CPM for approval. The project owner shall notify the District and CPM no later than 10 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 60 days following the source test date to both the District and CPM.

AQ-11 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
PM 10 ₄₀	<u>Less than or equal to</u> 6,935 LBS IN ANY 1 MONTH
VOC	<u>Less than or equal to</u> 4,930 LBS IN ANY 1 MONTH
SOx	<u>Less than or equal to</u> 1,065 LBS IN ANY 1 MONTH

The operator shall calculate the monthly emissions for VOC, PM~~10~~_{4.0} and SO_x using the equation below and the following emission factors: PM~~10~~_{4.0} 4.66 lbs/mmscf, VOC 2.93 lbs/mmscf, and SO_x 0.7~~1~~₂ lbs/mmscf.

Monthly Emissions, lb/month = X (E. F.)

Where X = monthly fuel use, mmscf/month and E. F = emission factor indicated above.

For the purposes of this condition, the limit(s) shall be based on the emissions from each individual combined cycle gas turbine **Units** No. 5 and No. 7.

Verification: The project owner shall submit the monthly fuel use data and emission calculations to the CPM in the Quarterly Operation Reports (**AQ-C8**).

AQ-14 The operator shall install and maintain a CEMS to measure CO concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry basis. ~~The CEMS shall be installed and operated, in accordance with an approved District Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from District. The CO CEMS shall be installed and operated within 90 days after the initial start-up of the gas turbines.~~ The CEMS shall be installed and operated to measure CO concentration over a 15 minute averaging time period. ~~Within two weeks of turbine start-up, the operator shall provide written notification to the District of the exact date of start-up.~~

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis:

$$\text{CO Emission Rate (lb/hr)} = K * C_{co} * F_d * (20.9 / (20.9\% - \%O_2 d))^* ((Q_g * HHV) / 1E6),$$

Where:

K = 7.267E-8 (lb/scf)/ppm

C_{co} = ~~Hourly a~~ **Average of** ppm based on four consecutive 15-min average CO concentrations, ppm

F_d = 8710 dscf/mmBtu natural gas

%O₂ d = Hourly average % by volume O₂, dry basis, corresponding to C_{co}

Q_g = Fuel gas usage during the hour, scf/hr

HHV = Gross high heating value of fuel, Btu/scf

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-15 The operator shall install and maintain a CEMS to measure NO_x concentration in ppmv. Concentrations shall be corrected to 15 percent oxygen on a dry

basis. The CEMS shall be installed and operating (for BACT purposes only) no later than 90 days after initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial startup and the provisional certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the turbine startup date, the operator shall provide written notification to the District of the exact date of start-up.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-16 The 2.0 PPM NO_x emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. The commissioning period shall not exceed 415 gas turbine operating hours. Startup time **periods** shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, start-ups and shutdowns shall be maintained and made available upon request from the District.

A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-17 The 2.0 PPM CO emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. The commissioning period shall not exceed 415 gas turbine operating hours. Startup time **periods** shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, start-ups and shutdowns shall be maintained and made available upon request from the District.

A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).

AQ-18 [Deleted]

~~The 16.55 LBS/MMCF NOx emission limit(s) shall only apply during the interim reporting period during the initial turbine commissioning period to report RECLAIM emissions. The interim reporting period shall not exceed 12 months from entry into RECLAIM.~~

~~**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-19 [Deleted]

~~The 8.66 LBS/MMCF NOx emission limit(s) shall only apply during the interim reporting period after initial turbine commissioning to report RECLAIM emissions. The interim reporting period shall not exceed 12 months entry into RECLAIM.~~

~~**Verification:** The project owner shall make the site available for inspection by representatives of the District, California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-20 The owner/operator shall comply at all times with the 2.0 ppm 1-hour BACT limit for NOx, except as defined in condition **AQ-16** and with the following additional restriction on startup.

NOx emissions shall not exceed 112 lbs total per startup per turbine. Each turbine shall be limited to 200 startups per year with each startup not to exceed 60 minutes in duration.

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall submit CEMS records demonstrating compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.

AQ-27 [Deleted]

~~This equipment shall not be operated unless the operator demonstrates to the District's Executive Officer that the facility holds sufficient RTCs to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the operator demonstrates to the District's Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emissions increase. The project owner shall submit all such information to the CPM for approval.~~

~~The operator shall, prior to the 1st compliance year, hold a minimum NO_x Reclaim Trading Credits (RTCs) of 104,864 lbs/yr. This condition shall apply during the 1st months of operation, commencing with the initial operation of the gas turbine.~~

~~The operator shall, prior to the beginning of all years subsequent to the 1st compliance year, hold a minimum of lbs/yr of 90,953 NO_x RTC's for operation of the gas turbine. In accordance with District Rule 2005 (f), unused RTC's may be sold only during the reconciliation period for the fourth quarter of the applicable compliance year inclusive of the 1st compliance year.~~

~~This condition shall apply to each turbine individually.~~

~~**Verification:** The project owner shall submit to the CPM copies of all RECLAIM reports filed with the District in each Quarterly Operational Report (see **AQ-C8**).~~

AQ-32 The 2.0 PPM VOC emission limit(s) shall not apply during turbine commissioning, startup and shutdown periods. The commissioning period shall not exceed 415 operating hours. Startup time periods shall not exceed 60 minutes for each startup. Shutdown periods shall not exceed 60 minutes for each shutdown. The turbine shall be limited to a maximum of 200 startups per year. Written records of commissioning, startups and shutdowns shall be maintained and made available upon request from the District.

~~A gas turbine operating hour during the commissioning period consists of 60 operating minutes. An operating minute occurs when the gas turbine fuel flow during that minute is greater than zero.~~

For the purposes of this condition, the beginning of start-up occurs at initial fire in the combustor and the end of start-up occurs when the BACT levels are achieved. If during start-up the process is aborted and the turbine is restarted, then the start-up and restart will count as one start-up, provided the total time for the start-up does not exceed 60 minutes. The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.

Verification: The project owner shall make the site available for inspection by representatives of the District, ~~California Air Resources Board (CARB), the United States Environmental Protection Agency (EPA) and the California Energy Commission (Commission).~~

AQ-35 [Deleted]

~~The owner/operator shall limit the total fuel usage for each turbine to no more than 1,500 million cubic standard feet (mmcsf) in any one calendar month.~~

~~The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.~~

Verification: ~~The project owner shall submit fuel usage records and all other records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.~~

AQ-36 The owner/operator shall keep records, in a manner approved by the District, for the following parameters or items:

Natural gas fuel use after CEMS certification.

~~Natural gas fuel use during the commissioning period.~~

~~Natural gas fuel use after the commissioning period and prior to the CEMS certification.~~

Verification: The project owner shall submit fuel usage records and all other records and calculations required to demonstrate compliance with this condition as part of the Quarterly Operational Report required in **AQ-C8**.

AQ-37 The owner/operator shall limit PM emissions from this facility to less than 100 tons in any one year. For the purpose of this condition, the PM emission limit shall be applicable to particulate matter with an aerodynamic diameter of less than 2.5 microns. For the purpose of this condition, any one year shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month. **The operator shall calculate the emissions using the calendar monthly fuel use data and the following emission factors: PM2.5: 4.66 lb/mmcsf for Gas Turbines No. 5 and No. 7 and 5.15 lb/mmcsf for Boiler No. 4.**

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-C8**.

AQ-40 [Deleted]

~~The operator shall on completion of construction, operate and maintain this equipment according to the following specifications:~~

~~The combined cycle gas turbine units 5 and 7 shall not operate simultaneously with boiler units 1,2, or 3 except for the 90 day period as stipulated in District~~

~~Rule 1313. El Segundo Power shall surrender the Permit to Operate (P/N F14448) for boiler no. 3 within 90 days of the start-up of the combined cycle gas turbines.~~

~~**Verification:** The project owner shall make the site available for inspection by representatives of the District, CARB, EPA and the Commission.~~

REFERENCES

- CEC 2005, California Energy Commission, El Segundo Power Redevelopment Project (00-AFC-14C) Commission Decision, February 2005.
- CEC 2010a, California Energy Commission, El Segundo Power Redevelopment Project (00-AFC-14C) Revised Staff Analysis of the Proposed Change to Dry Cooling and Other Project Changes, dated June 14, 2010.
- CEC 2010b, California Energy Commission, El Segundo Power Redevelopment Project (00-AFC-14C) Commission Decision to the Amendment, June 2010.
- CEC 2010c, California Energy Commission, CPV Sentinel Energy Project (07-AFC-3), Commission Decision, December 2010.
- CEC 2012, California Energy Commission, El Segundo Power Redevelopment Project (00-AFC-14C), Order Approving a Petition to Modify the Range of Ammonia Injection Rates, Eliminate a Venturi Scrubber, and Change the Project Name, Order No. 12-0808-4, August 2012.
- CEC 2014, California Energy Commission, El Segundo Energy Center, Final Staff Assessment Part A for the El Segundo Power Facility Modification Amendment to the El Segundo Energy Center, October 2014.
- ESEC 2014a, El Segundo Energy Center, Project Owner's Comments on the Final Determination of Compliance (TN# 203072), dated September 16, 2014.
- ESEC 2014b, El Segundo Energy Center, Project Owner's Petition to Amend the El Segundo Energy Center Project (TN# 203162), dated October 3rd, 2014.
- ESEC 2014c, El Segundo Energy Center, Units 5 and 7 Startup/Restart Information (TN# 203294), dated October 31st, 2014.
- NRG 2007, Application for a Determination of Compliance and Permit to Construct for the El Segundo Power Redevelopment Project, submitted to South Coast Air Quality Management District, dated June 21, 2007, posted September 18, 2007.
- NRG 2013, NRG / El Segundo Energy Center LLC (TN 70442) Petition to Amend, dated April 2013. Submitted to CEC on 04/23/2013.
- SCAQMD 2010, South Coast Air Quality Management District, El Segundo Power Redevelopment Project (00-AFC-14C), Second Addendum to Determination of Compliance (TN# 56837), dated May 14, 2010, submitted to CEC/Docket Unit 5/25/10.
- SCAQMD 2014a, South Coast Air Quality Management District, El Segundo Power

Facility Modification Project, Final Determination of Compliance (TN# 202999),
dated August 26, 2014.

SCAQMD 2014b, South Coast Air Quality Management District, El Segundo Power,
LLC – Title V Administrative Permit Revision, dated November 25, 2014.