
# THE MISSION COMPATIBILITY EVALUATION PROCESS

## ANNUAL REPORT TO CONGRESS
## ON THE DOD SITING CLEARINGHOUSE

## CALENDAR YEAR 2013

**Pursuant to Section 358(f) of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011, Public Law 111-383**
**and**
**Senate Report 113-44, Page 91, *Mission Compatibility Evaluation Reviews,* which accompanied the National Defense Authorization Act for Fiscal Year 2014**

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## INTRODUCTION

In accordance with section 358(f) of the Ike Skelton National Defense Authorization Act (NDAA) for Fiscal Year 2011[1], the Department of Defense (DoD) submits its CY 2013 report on the progress of its Mission Compatibility Evaluation (MCE) process. The Department's MCE process is designated to support the objective identified in section 358(a) "to ensure that the robust development of renewable energy sources and the increased resiliency of the commercial electrical grid may move forward in the United States, while minimizing or mitigating any adverse impacts on military operations and readiness."

Established in 2010, the DoD Siting Clearinghouse manages the MCE process under the Deputy Under Secretary of Defense for Installations and Environment (DUSD(I&E)), designated as the lead organization pursuant to section 358(b)(1). The Clearinghouse is overseen by a Board of Directors, chaired by the DUSD(I&E) and co-chaired by the Deputy Assistant Secretary of Defense (Readiness) (DASD(R)) and the Principal Deputy Director, Operational Test and Evaluation. The MCE process fully engages the Military Departments (MILDEPs) and the Joint Staff, allowing the Clearinghouse to provide a single DoD voice with regard to the review of projects filed with the Federal Aviation Administration (FAA) if such projects might represent an unacceptable risk to national security.

In this fourth annual report, the Department summarizes its achievements, highlights the status of the Department's MCE reviews, and reports progress on the five mission compatibility risk factors identified by Congress[2]. This report also responds to the request for information in Senate Report 113-44, page 91, which accompanied the FY 2014 NDAA. That report urged the Department to use consistent standards and procedures for the MCE process and requested details on the status of its review process for each applicant.

## ACHIEVEMENTS IN CALENDAR YEAR 2013

### Outreach

On December 5, 2013, the Department published procedures for the MCE process to the public and applicants[3]. Published as 32 C.F.R. Part 211, the *Mission Compatibility Evaluation Process* finalizes the interim instructions published in October 2011 and addresses the public and industry comments received during the review process. By publishing *Mission Compatibility Evaluation's* "final rule," the Department has provided the public and applicants with a standard process, as urged in Senate Report 113-44.

[1] A list of abbreviations is located at Appendix B.
[2] Sections 358(f)(2)(B) through 358(f)(2)(F) identify five risk factors that DoD is requested to comment upon in its annual report. Previous annual reports are available at: http://www.acq.osd.mil/dodsc/about/library.html.
[3] The MCE rule is available at: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=284108d7dca87a6bea95165fd1c1b0be&ty=HTML&h=L&r=PART&n=32y2.1.1.1.1.16.

Multiple Defense organizations have worked together to support the MCE process and have recognized the opportunity to integrate existing DoD encroachment management programs. The Office of Economic Adjustment (OEA), for example, is encouraging state and local governments to use the Joint Land Use Study (JLUS) planning process at locations of interest to the MCE process. These include JLUS efforts at Naval Air Station Patuxent River, Maryland, and Seymour Johnson Air Force Base (AFB), North Carolina, as well as a regional study in the areas around White Sands Missile Range, Holloman AFB, and Fort Bliss in southern New Mexico and western Texas. This regional study will identify a framework for cities, counties, Indian tribal governments, and the states to facilitate early submission of renewable energy project proposals to the Clearinghouse for MCE review.

Likewise, the Readiness and Environmental Protection Integration (REPI) program provided the Department and associated local communities near military installations and ranges with another tool to mitigate or remove restrictions to military operations and readiness, including the Department's test and evaluation activities[4]. As an example, the REPI program initiated a project to establish protective easements near the Dare County Bombing Range, North Carolina, partly on the basis of the potential impact of wind turbine projects near low-altitude Military Training Routes (MTRs) that support Air Force, Navy, and Marine Corps training missions. Funding for this REPI project was partially provided by the Office of the DASD(R).

As part of the Department's outreach effort in CY 2013, Clearinghouse representatives spoke at key industry gatherings, such as the annual conferences for the International Test and Evaluation Association and the World Energy Engineering Congress. The Clearinghouse also presented MCE briefings at regional conferences and meetings, such as those sponsored by the American Wind Energy Association and the Western Regional Partnership. DoD participated in the Natural Resources Defense Council webinar on renewable energy siting and met with the National Conference of State Legislatures (specifically its Energy Supply Task Force) to identify ways in which the states can assist the Department in its MCE process.

To further the Clearinghouse's public and industry outreach strategy, the Department published the *DoD Plan for Permitting of Renewable Energy Infrastructure Projects* and participated in the development of a primer on *Working with the Department of Defense: Siting Renewable Energy Development*. In addition, the Clearinghouse submitted a *Report to Congress on Unacceptable Risk from Commercial Energy Projects*, pursuant to Senate Report 112-173, accompanying the FY 2013 NDAA.[5] In conjunction with the "final rule" published in the Federal Register as 32 C.F.R Part 211, these documents provide guidance to the public and applicants on the MCE process.

## Governance

To improve the Department's governance, the Clearinghouse published three procedural memos[6] in CY 2013 that both improved internal processes and communicated them to the field.

[4] Reference to military operations and readiness, as noted in section 358(j)(3), includes the Department's robust developmental and operational testing and evaluation activities.
[5] These siting documents are available at: http://www.acq.osd.mil/dodsc/about/library.html.
[6] These procedural memos are available at: http://www.acq.osd.mil/dodsc/about/library.html.

These were:

- *DoD Siting Clearinghouse Process Flow Diagrams;*
- *DoD Project Review in Support of the FAA Obstruction Evaluation (FAA/OE) Process;* and
- *Standard Procedure for the DoD Siting Clearinghouse Review of Committee on Foreign Investment in the United States Issues.*

**Research & Development (R&D)**

**Wind Turbine-Radar Interference.** Modern radars differentiate between stationary and moving objects using a phenomenon called "Doppler shift." Wind turbines in the radar line of sight detect the Doppler shift of the rotating turbine blades and this interferes with the radar system. In CY 2013, the Department completed its hallmark 3-year, $8 million Interagency Field Test and Evaluation (IFT&E) R&D program. Together with partners in the Department of Energy (DOE), FAA, and the Department of Homeland Security, the program scientifically documented the impact of wind turbine interference on the nation's ground-based air surveillance radars (ASRs). Interference from wind turbines, specifically reductions in the radar's performance (ability to identify and track aircraft within the "clutter" created by the wind turbine interference), and the creation of radar "false targets" (from interference from rotating wind turbine blades within the radar line of sight) were documented. Lastly, the program evaluated the effectiveness of eight commercial-off-the-shelf mitigation options.

Segmented into three 2-week IFT&E flight campaigns, the program ran 450 flight hours to document the effects of wind turbine projects on two long range surveillance radars and one air navigational radar. Program sponsors selected these radars because they were known to be impacted by nearby wind turbine projects. As to mitigation solutions, both "X-Band" infill and phased-array radars were shown to significantly mitigate the impact of wind turbine projects on impacted ASRs. The program[7] exceeded its objectives and provided a clear roadmap for future initiatives.

**Technical Interchange Initiative.** To explore the full extent of a mission compatibility R&D initiative, the Department hosted a series of Technical Interchange Meetings (TIMs) and met with key science and technology advisors and selected DOE National Laboratories. The TIMs hosted this year included:

- **Wind Turbine-Military-Unique Long Range Radar Interference.** Radar experts from the Relocatable Over-the-Horizon Radar (ROTHR) community, academia, and wind turbine developers participated in two TIMs to explore the potential impact of wind turbines on the ROTHR system. As a result of this collaboration, DoD was able to improve the electromagnetic modeling and simulation for determining impacts to ROTHR from wind turbines. This effort will continue through CY 2014 and may include the further identification of feasible and affordable mitigation solutions.

[7] A series of fact sheets are available at: http://www1.eere.energy.gov/wind/pdfs/ifte_radar_mitigation.pdf.

- **Wind Turbine-Military-Unique Airborne Radar Testing Interference.** This government-only TIM focused the attention of DoD on obtaining a better understanding of the technical limitations associated with these sophisticated radars when operating in the air-to-ground mode and with wind turbines within the field of view of the airborne radar. The outcome of this TIM will help the Department establish High Risk of Adverse Impact Zones (HRAIZ) around the Naval Air Weapons Station (NAWS) China Lake Ranges and Edwards Air Force Test Center in California, as well as the Nevada Test and Training Range. This work will continue into CY 2014.

- **Glint and Glare (G&G).** Glint is defined as the momentary flash of bright light, and glare is defined as a continuous source of bright light, both potentially hazardous to air operations. To further explore issues studied during a CY 2012 TIM concerning solar power tower G&G impact on military aviation operations, this TIM addressed the effects of G&G from non-tracking photovoltaic and solar hot water heating systems located on or near military airfields. The FAA participated in the TIM, as they had experienced significant G&G issues at the Manchester-Boston Regional Airport. As a result of this experience, the FAA commissioned technical studies and developed a modeling tool to predict the operational impact. The Department is currently exploring how to incorporate recently published FAA guidance[8] into the MCE process.

- **Power Line Electromagnetic Interference (EMI).** The continued development of renewable energy across the nation requires a number of new High Voltage Transmission Lines (HVTLs) to be constructed. These HVTLs, when located near DoD test ranges, may present an EMI issue to sensitive military test activities, especially at the Army's Buffalo Soldier Electronic Proving Grounds at Fort Huachuca, Arizona; the White Sands Missile Range, New Mexico; the Air Force's Utah Test and Training Range; and the Nevada Test and Training Range, among others. In CY 2013, the Clearinghouse collaborated with the Department's Test Resource Management Center (TRMC) and began a multi-year R&D effort to both identify the scope of the EMI issue and to develop modeling and simulation computer codes for predicting the level of impact. These efforts will lead to publishing technical specifications for the power industry that authoritatively establish the threshold of HVTL EMI allowable at each of these military test and training ranges.

## PROJECT REVIEWS

**Formal Reviews via the FAA/OE Process.** Section 358(f)(2)(A) requires that the Department report annually on the results of their review of applications filed in accordance with the FAA/OE's process (49 U.S.C. 44718). In CY 2013, the Clearinghouse used its MCE process

[8] FAA's guidance was published in the Federal Register, and is available at: https://www.federalregister.gov/articles/2013/10/23/2013-24729/interim-policy-faa-review-of-solar-energy-system-projects-on-federally-obligated-airports.

to evaluate 2,075 projects[9] filed by applicants. This constitutes a 17% increase in applicant filings compared to CY 2012; during an average CY 2013 month, the Clearinghouse and supporting organizations reviewed 173 projects.

Under the procedures in 32 C.F.R. Part 211, the Department routinely completes its MCE within 30 days of receipt. In CY 2013, the typical project took 14 days to be processed. Many projects close out upon first inspection; however, a number of projects each month required more detailed analysis or discussions with the applicant and the associated Clearinghouse supporting organizations to identify potential mitigation solutions. In CY 2013, the DoD averaged 29 projects in extended review at any one time (e.g., in the MCE process longer than 30 days).

Table 1 is a snapshot of the number of projects in the MCE process, as of December 31, 2013. These projects carried over into CY 2014.

| Duration in the MCE Process | # of Projects |
|---|---|
| Greater than 120 days old | 16 |
| Between 60-119 days old | 11 |
| Between 31-59 days old | 7 |
| Less than 30 days old | 57 |
| Total | 91 |

**Table 1. Project Duration in the Mission Compatibility Evaluation Process (as of December 31st, 2013)**

The Clearinghouse provided a response to the FAA of "No Objection"[10] on a total of 2,084 projects in CY 2013; nine projects more than the number of projects received. The number of projects responded to (cleared) is slightly larger than projects received due to projects carried over from last year that cleared this year.

A month-by-month trend of projects received, carried over, and cleared in CY 2013 is shown in Figure 1.

The information in the figure is color coded as follows:

- **Dark Blue Bar:** Number of new projects filed as of the last day of the month identified;
- **Light Blue Bar:** Total number of projects carried over from previous months, as of the first day of the month;
- **Red Bar:** Number of projects cleared in the last day of the month identified – regardless of when the project was filed.

[9] When applicants file in FAA/OE's computerized system, they file individual structures (obstructions) identified by FAA with an Aeronautical Study Number (ASN). For a wind turbine project, this entails entering data on each single turbine, regardless of the number within the total project – the Department follows the FAA's grouping of ASNs under a single filing as a project – regardless if it is a filing for a single turbine or a project consisting of 200 turbines.

[10] A "No Objection" response by the Department clears the way for FAA to issue a Determination.

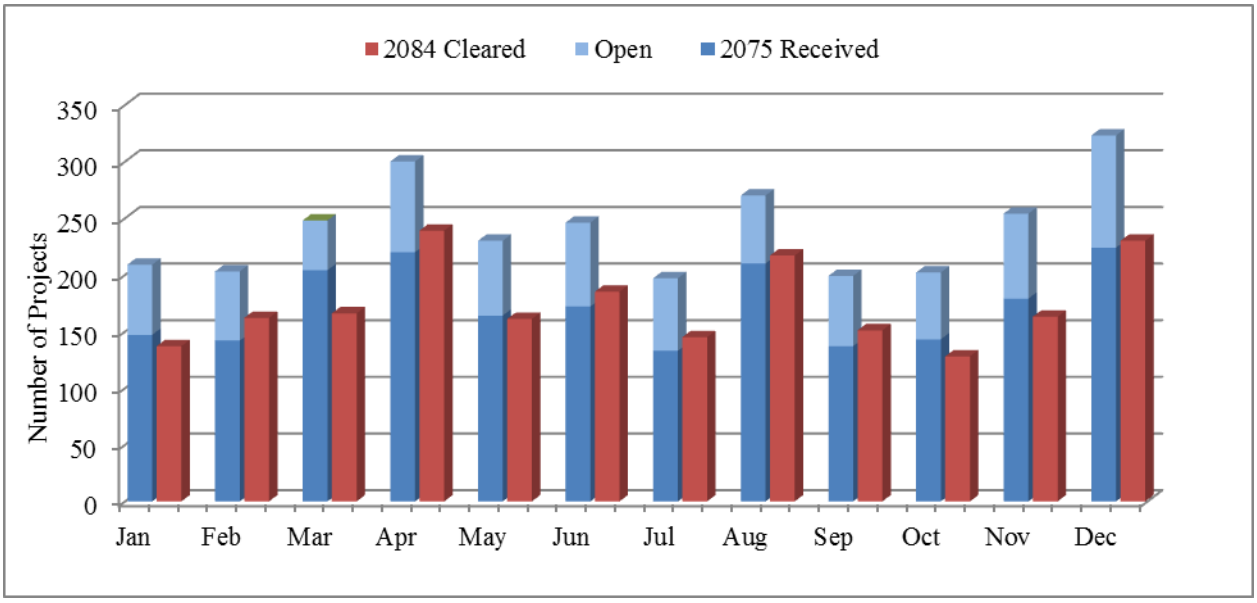


**Figure 1. Clearinghouse Workload by Month for CY 2013**

In order to resolve projects that may have adverse impact to military operations and readiness, the Clearinghouse establishes Mitigation Response Teams (MRTs). As of December 31, 2013, there were nine MRTs engaged in mitigation discussions associated with 15 projects. In accordance with section 358(c)(1)(B), the MRTs consider proposed viable mitigation options, defined as "feasible and affordable" actions. Two of the MRTs identified viable mitigation solutions, and the Department is in the final stages of documenting those agreements.

In accordance with the request in Senate Report 113-44, page 91, Appendix A provides a detailed list of applicant filings in CY 2013.

**Informal Reviews.** Section 358(c)(4) requires that the Clearinghouse establish and publish[11] a process for conducting early outreach to parties wishing to develop projects that potentially impact military operations and readiness. Early informal review discussions with developers allow for potential project modifications that alleviate the need for mitigation discussions when and if projects are formally filed within the FAA/OE process. In CY 2013, developers submitted 60 projects for informal review, a 21% decrease in the number of informal reviews requested by applicants compared to the previous calendar year. Of the 60 projects reviewed, 20 raised the potential for mission compatibility concerns and were offered further discussion.

**Projects Submitted to DoD by other Federal Agencies.** In addition to the procedures established in 32 C.F.R. Part 211 for the formal or informal review process, the Clearinghouse

[11] The informal review process was published in the Federal Register and can be downloaded from: http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=1&SID=284108d7dca87a6bea95165fd1c1b0be&ty=HTML&h=L&r=PART&n=32y2.1.1.1.1.16.

also established processes[12] to review the mission compatibility of energy-related projects submitted by the Department of the Interior through the Bureau of Land Management (BLM) and the Federal Energy Regulatory Commission (FERC). In CY 2013, the Clearinghouse reviewed eight BLM projects – one of which (SunZia Southwest Transmission Project) was determined[13] to have an unacceptable risk to national security. Other than the SunZia project, all other projects were determined to have no adverse impact to military operations and readiness. While these projects were not filed via the FAA/OE process[14], the Clearinghouse used standard MCE procedures and reported its findings directly to the departments and agencies involved.

**Unacceptable Risk to National Security of the United States.** To make the determination that a project potentially rises to an unacceptable risk to national security[15], the proposed project would need to:

- Endanger safety in air commerce, related to the activities of DoD;
- Interfere with the efficient use and preservation of the navigable airspace and of airport traffic capacity at public-use airports, related to the activities of DoD;
- Significantly impair or degrade the capability of DoD to conduct training, research, development, testing and evaluation, or operations, or to maintain military readiness.

**Non-Energy Related Objections Filed via the FAA/OE Process.** The FAA/OE process requires applicants to file information about individual structures for consideration if they potentially present an obstruction to the safe navigation of air commerce. In CY 2013, FAA/OE filers supplied information about 78,172 structures[16], of which 35,840 filings were reviewed explicitly as renewable energy projects or HVTL structures. Of the remaining 42,332 structures filed, most were commercial radio/TV/cellular radio transmission towers or tall buildings.

The Department recognizes that section 358 requires a comprehensive mission compatibility review of all projects submitted to the FAA/OE process. To date, the Office of the Secretary of Defense (OSD) has concentrated its mission compatibility reviews on energy projects, as they are the most controversial projects with the greatest potential to impact military operations and readiness. While OSD was focused on energy projects, the MILDEPs' Air Traffic Control specialists reviewed these non-energy filings to ensure safe navigation for aircraft on final approach or departure from a military airfield in accordance with standard

[12] In general these processes and procedures are documented via interagency Memoranda of Agreements (MOAs). The MOAs currently in force with the Clearinghouse are available at: http://www.acq.osd.mil/dodsc/about/library.html.

[13] On March 19, 201,3 Under Secretary of Defense Kendall wrote Deputy Secretary of the Interior Hayes regarding the SunZia Southwest Transmission Project, and objected to the routing proposed in the Final Environmental Impact Statement, and offered an alternative route that would be acceptable to DoD.

[14] While these renewable energy or power line projects were not filed using the FAA/OE procedures, once the DOI or FERC finishes their internal processes, the applicants most likely will file with FAA.

[15] For further details, refer to the Clearinghouse Report to Congress on Unacceptable Risk of Commercial Energy Projects. This report is available at: http://www.acq.osd.mil/dodsc/library/RTC%20UR%20Final.pdf.

[16] As noted earlier, the Clearinghouse tends to discuss filings as groups of individual structures or potential obstructions. However, since generally these non-energy related filings are for a single structure, these data are provided as individual obstructions versus groups of individual filings, or FAA defined ASNs.

Terminal Instrument Procedures. In CY 2013, 17 non-energy related obstructions were determined to be a potential hazard to military operations and readiness. As such, the Department identified these 17 obstructions as an objection within the FAA/OE process, and the FAA, in accordance with their procedures, notified applicants of a Notice of Presumed Hazard (NPH). After the consultation phase permitted by the FAA's NPH process, applicants voluntarily terminated eight filings and resolved six others. Three filings remain under review and in discussion for mitigation.

**The Evaluation Process for Offshore Renewable Energy Development.** Unlike onshore projects, the Department evaluates offshore MCE projects in collaboration with the Department of the Interior's Bureau of Ocean and Energy Management (BOEM) offshore leasing process (30 C.F.R 585). The ODASD(R), in coordination with the Clearinghouse and Test and Evaluation community, leads DoD's offshore MCE process to ensure that the Department's evaluation efforts are consistent with the statutory objectives expressed in section 358 and 32 C.F.R Part 211. Additionally, the Department's assessments produced for BOEM leasing purposes can be used when applicants ultimately file their projects under FAA/OE process – at least for those projects that are sited within the confines of FAA's authority out to the territorial sea boundary.

## RISK ASSESSMENTS REQUESTED BY CONGRESS

Sections 358(f)(2)(B) through 358(f)(2)(F) require specific risk assessments to be included in this report. These include:

**Loss of Military Training Routes [sec 358(f)(2)(B)].** No military training routes (MTRs) were lost to the development of projects filed with the FAA/OE process during CY 2013; however, standard operating procedures for a number of MTRs have been or will be modified to accommodate development.

To ensure that the Department's MTRs are not significantly impacted by development, the Clearinghouse published a procedure for developers to download MTR information in an electronic format compatible with standard industry Geospatial Information Systems[17] on its website. Additionally, the Department plans to publish a series of special maps to assist the industry in knowing where DoD has significant risk concerns.

The Department of the Navy has completed mapping the military operations and readiness risk concerns in areas around the testing complex at NAWS China Lake Ranges, California; the Naval Weapons System Training Facility (NWSTF) Boardman, OR; and the Naval Air Station Patuxent River, Maryland, and associated Atlantic Test Ranges. The Department of the Air Force also mapped the risk concerns for Edwards AFB, California and the Nevada Test and Training Range. The Department plans to publish HRAIZ maps in CY 2014.

**State Activities in Support of the Mission Compatibility Process.** Some states have implemented or strengthened state and local planning processes to further enhance the MCE

[17] See question #5 in the Frequently Asked Questions tab on the Clearinghouse web site. See: http://www.acq.osd.mil/dodsc/about/faq.html.

process, as well as to reduce the risk of losing military training routes within their borders. Several examples are:

**California.** In CY 2013, the Department continued to work with the California Energy Commission and other stakeholders on the *Desert Renewable Energy Conservation Plan* (DRECP) under the provisions of an October 2011 Memorandum of Understanding (MOU)[18]. As the DRECP planning team updated the Development Focus Areas (DFA) within the Mojave and Colorado/Sonoran deserts ecosystem of southern California, the Department updated its MCE, which was originally provided in July 2012, to indicate potential areas of unacceptable risk to national security. When the DRECP is published, these DFAs will help applicants understand where the location of renewable energy projects should not be an issue for DoD.

The Department's efforts in California extend beyond its responsibilities under the DRECP through participation in the formation of a collaborative partnership between DoD, the California Governor's Office of Planning and Research (CA-OPR), and the myriad cities and counties that host DoD installations within the state. Most notably, in CY 2013 the Clearinghouse benefited from the Department's OEA grant to the CA-OPR supporting the state's efforts to ensure that local government land use planning is compatible with the military's needs concerning military operations and readiness. Through this grant, the CA-OPR enhanced the state's capacity to engage with local governments throughout California to help maintain the vital missions of all DoD installations, including test and training ranges. The CA-OPR formally notified every city and county in California of their responsibility to consider military operations and readiness in local planning laws and provided technical assistance to local governments to incorporate existing statutory requirements providing for protection of military airspace into their local planning, zoning and land use plans, ordinances and processes.

California State Senate Bills 1462[19] and 1468[20] significantly support the Department's MCE efforts, and combined, these two laws require local governments to consider the impact of new development on mission compatibility for areas near military installations and ranges, beneath MTRs, or within special use airspace. These laws also require early notification to DoD when a development project is proposed within 1,000 feet of a military installation, within special use airspace, or under a low-altitude level flight path in California. OEA support in CY 2013 has assisted the state, in coordination with the MILDEPs, to conduct direct outreach to local governments. Using data provided by the Department, California has now developed an interactive online planning tool[21] identifying MTRs and special use airspace to assist land use planners and

[18] This MOU is available at: http://www.drecp.org/documents/docs/Renewable_Energy_Action_Team_and_Dept_of_Defense_MOU_Dec_2011.pdf.
[19] SB 1462 (Cal. Gov. Code sections 65352 (a)(6), 65940, 65944) is available at: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200320040SB1462&search_keywords=.
[20] SB 1468 (Gov. Code section 65302 (a)(2)) is available at: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200120020SB1468&search_keywords=.
[21] The California Military Land Use Compatibility Analyst is available at: http://cmluca.projects.atlas.ca.gov/

project developers, including renewable energy developers, with this notification and coordination process.

**North Carolina.** In May 2013, Governor McCrory signed House Bill (HB) 484[22], *A Permitting Program for the Siting and Operation of Wind Energy Facilities,* which provided a set of procedures for raising the potential mission compatibility impacts of wind turbine projects on military operations and readiness early in the development process. This new law requires developers to request a pre-application meeting with the North Carolina Department of Environment and Natural Resources (NC-DENR) in order to identify any potential risks to military air navigation routes, air traffic control areas, military training routes, special use air space, radar, or other military operations. The NC-DENR is required to provide written notice to the commanding officers of each major military installation in the state of the proposed renewable energy project and invite them to participate in the review process. The law also requires the NC-DENR to notify the Clearinghouse of any mitigation actions agreed to by the applicant and the NC-DENR to be notified of any mitigation actions agreed to by the applicant and the Clearinghouse. The Department is actively collaborating with the NC-DENR as they develop implementation instructions for HB 484.

**New York.** The *Power NY Act of 2011* established a process for the siting of electricity generating facilities, including renewable energy projects. As part of the state's process, a multi-agency Siting Board is charged with streamlining the permitting process for power plants of 25 megawatts or greater. As part of the Siting Board's process, airport operators, including military installations with airfield operations, may petition the Siting Board should they feel that a proposed energy project might adversely impact safe aircraft operations. Additionally, New York State Senator Parker introduced NY SB 2848 on January 23, 2013, which proposes amending the public authorities law in relation to directing the New York Energy Research and Development Authority to conduct a study regarding siting processes for wind energy production facilities. The bill remains in committee, and the Clearinghouse is monitoring its progress.

**Effects of Glint and Glare on Military Readiness [sec 358(f)(2)(C)].** Due to the recent validation of G&G problems by the FAA and Sandia National Laboratories, the Department is examining its G&G policies and procedures.

During the TIM on G&G hosted in August, 2013, the FAA reported findings of serious visual impacts from reflected G&G on both pilots on approach to land and Air Traffic Controllers (when located in air traffic control towers) from solar photovoltaic and solar hot water heating systems located on or near airports. In response to these findings, the FAA issued interim policy[23] and required airport operators to evaluate the potential of G&G using the Solar Glare Hazard Analysis Tool developed by Sandia National Laboratories. The Clearinghouse is preparing a procedural memo on G&G, which we anticipate publishing in CY 2014.

[22] HB 484 is available at: http://www.ncleg.net/Sessions/2013/Bills/House/PDF/H484v9.pdf
[23] FAA's interim policy is available at: https://www.federalregister.gov/articles/2013/10/23/2013-24729/interim-policy-faa-review-of-solar-energy-system-projects-on-federally-obligated-airports.

**Effects of Wind Turbine Interference [sec 358(f)(2)(D)].** Assessment of the risk associated with interference generated from proposed wind turbine projects continues.

As noted earlier, the Clearinghouse participated in the IFT&E Program, which reviewed air traffic control mission impacts from wind turbines and evaluated operational impacts to the standard DoD and FAA Digital Airport Radar System and other air surveillance radars. The review validated that primary surveillance radar performance is degraded over wind turbines and that secondary radar, global positioning systems, and onboard radios are not degraded.

The Clearinghouse initiated a R&D effort in CY 2013 utilizing the combined expertise of the Navy's ROTHR Program Management Office, Air Force and Navy Research Laboratories, MIT/Lincoln Laboratory (MIT/LL), Sandia National Laboratories, and the MITRE Corporation to investigate the impact of wind turbine interference on the ROTHR systems in Virginia, Texas, and Puerto Rico. This military-unique radar plays a critical role in U.S. Southern Command's counter-illicit trade monitoring and detection, and the goal of this ongoing research is to establish a methodology for computing acceptable standoff distances from the ROTHR system and any potential wind turbine project proposed for development in the vicinity. The methodology will eventually be used to compute and publish HRAIZ maps for the ROTHR system.

The Clearinghouse also collaborated in CY 2013 with the Department's TRMC, who funded an Idaho National Laboratory (INL) project to characterize the potential EMI hazard from high voltage transmission lines, such as the SunZia project, that are planned in the vicinity of the White Sands Missile Range, New Mexico, and the Buffalo Soldier Electronic Proving Grounds, near Fort Huachuca, Arizona. This is part of a larger effort that MIT/LL is conducting, and the Department has extended the INL effort into CY 2014 in order to create a power line EMI modeling tool that will be useful across DoD.

**Impact to National Defense Radar Systems [Sec 358(f)(2)(E)].** Sixteen of the Nation's defense radars are moderately to significantly impacted by wind turbine development.

The North American Aerospace Defense Command (NORAD) relies on an interagency network of 233 air surveillance radars to enable aerospace control and air defense of the United States, consisting of 115 long range and 118 short range radar systems. The Department of the Air Force assessed that 148 of these 233 radars were impacted to some degree by wind turbine projects[24]; 16 of these radars were categorized as having moderate or significant performance impacts due to wind turbine operations. Of these 16 radar systems, four are of primary concern for NORAD.[25]

During CY 2013, NORAD supported the MCE process and reviewed 1,126 projects filed under the FAA/OE process. These projects included 6,741 individual wind turbines, of which 99.98% posed no NORAD mission concerns. In CY 2013, NORAD identified only one

[24] The Air Force's 84th Radar Evaluation Squadron, Hill AFB, Utah conducts detailed radar equipment assessments and evaluates the potential impacts from wind turbine interference. The process considers all existing and planned wind turbines within the radar line of sight.

[25] The four radar systems referenced are: Fossil (Oregon) Common Air Route Surveillance Radar (CARSR); Boron (California) CARSR; Joliet (Illinois) CARSR, and; Oilton (Texas) Air Route Surveillance Radar model 4 (ARSR-4).

proposed wind energy project (the Saddle Butte Wind Park project in northern Oregon) posing an adverse impact and referred the project to the Clearinghouse for creation of an MRT. The Department of the Navy also raised mission concerns regarding this same project for reasons of low-altitude flight training in MTRs leading into restricted airspace associated with NWSTF Boardman, Oregon. As a result of NORAD's operational risk assessment, and responding to concerns by the Department of the Navy, the Clearinghouse established a MRT to address the concerns related to the Saddle Butte Wind Park project in November 2013, and raised its concern to the Oregon Energy Facility Siting Council.

**Description of Standoff Distances used to Prescreen Projects [sec 358(f)(2)(F)].** Due to the wide variety of missions and the variability of impacts on different types of obstructions, it is not possible to apply a "one-size-fits-all" standoff distance between military operations and readiness activities and development projects in order to prescreen applications under the MCE process.

The Department, however, is committed to publishing HRAIZ maps depicting standoff distances around, or in the vicinity of DoD installations. These maps establish areas of concern that might not be readily identified by traditional mapping or airspace charts. The Department's approach is to publish maps depicting areas of concern in order to inform developers, state and local officials, and the general public that development in these areas is likely to adversely impact military operations and readiness activities, and to invite developers/others to work with the Clearinghouse to identify a compatible solution. Examples of the HRAIZ process include Department of the Navy mission impact assessments for airborne electronic attack combat maneuver training conducted at NWSTF Boardman, Oregon, and research, development, acquisition and test and evaluation activities conducted at Atlantic Test Ranges, Maryland and NAWS China Lake Ranges, California. As noted earlier in this report, the Department is aggressively working to begin publication of maps for areas of high risk during CY 2014.

In order to further tailor hazard maps to specific conditions, the Clearinghouse has requested and received special privileges in the FAA/OE computer system and receives automatic notifications of every renewable energy and HVTL application. In CY 2013, the Clearinghouse also provided developers and the public with a process of requesting computerized geospatial mapping products[26] of DoD installations and ranges, as well as details on the locations and characteristics of MTRs, military operating areas, and special use airspace. Additionally, the Clearinghouse is financially supporting efforts within the Department of the Navy to develop a geographic information system in support of the MCE process.

## CONCLUSION

In CY 2013, the Clearinghouse successfully standardized its procedures and published them in the Federal Register. The Department concluded the first phase of a multi-year R&D effort and published significant technical documentation on the wind turbine-radar interference issue. In addition to continually collaborating with state and other Federal agencies, the

[26] Geospatial "shape files" can be obtained by contacting the Clearinghouse at: osd.dod-siting-clearinghouse@mail.mil.

Clearinghouse has continued efforts to reach out to state and local land use planning agencies, non-governmental organizations, and technical associations to ensure that the mission compatibility evaluation processes is understood and enhanced. There are a number of actions underway in CY 2014 that build on the Department's mission compatibility efforts.

# Appendix A
## Detailed List of Applicant Filings
## Calendar Year 2013
## Mission Compatibility Evaluation Process

The following information is provided in response to the request for detailed information on applicant filings in Senate Report 113-44, page 91, *Mission Compatibility Evaluation Reviews*.

The DoD Siting Clearinghouse received 2,075 projects from applicants through the Federal Aviation Administration's Obstruction Evaluation process in Calendar Year 2013. The breakout below lists the applicant's projects by both category of application and by state.

**Projects Received by DoD Siting ClearingHouse CY2013**

| Row | State | Wind Turbine | Solar | MET | Transmission | Misc | Total |
|---|---|---|---|---|---|---|---|
| 1 | Alabama | 5 | 0 | 2 | 23 | 0 | 30 |
| 2 | Alaska | 25 | 1 | 10 | 10 | 0 | 46 |
| 3 | Arizona | 4 | 4 | 0 | 13 | 1 | 22 |
| 4 | Arkansas | 0 | 0 | 0 | 4 | 1 | 5 |
| 5 | California | 43 | 28 | 12 | 135 | 7 | 225 |
| 6 | Colorado | 20 | 4 | 7 | 5 | 0 | 36 |
| 7 | Connecticut | 1 | 2 | 0 | 7 | 0 | 10 |
| 8 | Delaware | 0 | 0 | 0 | 2 | 0 | 2 |
| 9 | Florida | 2 | 0 | 0 | 151 | 0 | 153 |
| 10 | Georgia | 0 | 4 | 1 | 23 | 1 | 29 |
| 11 | Hawaii | 12 | 26 | 0 | 2 | 3 | 43 |
| 12 | Idaho | 0 | 0 | 0 | 6 | 0 | 6 |
| 13 | Illinois | 10 | 0 | 3 | 38 | 0 | 51 |
| 14 | Indiana | 21 | 0 | 3 | 35 | 0 | 59 |
| 15 | Iowa | 95 | 0 | 6 | 7 | 0 | 108 |
| 16 | Kansas | 16 | 1 | 15 | 36 | 0 | 68 |
| 17 | Kentucky | 0 | 0 | 0 | 12 | 0 | 12 |
| 18 | Louisiana | 0 | 0 | 0 | 3 | 0 | 3 |
| 19 | Maine | 4 | 0 | 1 | 5 | 0 | 10 |
| 20 | Maryland | 8 | 2 | 5 | 11 | 0 | 26 |
| 21 | Massachusetts | 10 | 14 | 0 | 21 | 0 | 45 |
| 22 | Michigan | 21 | 1 | 2 | 30 | 0 | 54 |
| 23 | Minnesota | 14 | 0 | 2 | 33 | 0 | 49 |
| 24 | Mississippi | 0 | 0 | 0 | 1 | 1 | 2 |
| 25 | Missouri | 1 | 0 | 0 | 5 | 2 | 8 |
| 26 | Montana | 10 | 0 | 0 | 4 | 0 | 14 |
| 27 | Nebraska | 32 | 0 | 3 | 20 | 1 | 56 |

**Projects Received by DoD Siting ClearingHouse CY2013**

| Row | State | Wind Turbine | Solar | MET | Transmission | Misc | Total |
|---|---|---|---|---|---|---|---|
| 28 | Nevada | 1 | 0 | 0 | 8 | 0 | 9 |
| 29 | New Hampshire | 2 | 0 | 3 | 8 | 0 | 13 |
| 30 | New Jersey | 0 | 2 | 1 | 62 | 0 | 65 |
| 31 | New Mexico | 13 | 0 | 2 | 9 | 0 | 24 |
| 32 | New York | 32 | 4 | 1 | 29 | 0 | 66 |
| 33 | North Carolina | 2 | 5 | 1 | 6 | 3 | 17 |
| 34 | North Dakota | 11 | 0 | 1 | 10 | 0 | 22 |
| 35 | Ohio | 18 | 0 | 1 | 64 | 0 | 83 |
| 36 | Oklahoma | 20 | 0 | 7 | 30 | 0 | 57 |
| 37 | Oregon | 8 | 0 | 3 | 39 | 0 | 50 |
| 38 | Pennsylvania | 10 | 0 | 4 | 43 | 0 | 57 |
| 39 | Rhode Island | 3 | 0 | 0 | 2 | 0 | 5 |
| 40 | South Carolina | 0 | 0 | 0 | 13 | 0 | 13 |
| 41 | South Dakota | 3 | 0 | 0 | 6 | 0 | 9 |
| 42 | Tennessee | 0 | 0 | 1 | 11 | 0 | 12 |
| 43 | Texas | 103 | 1 | 18 | 62 | 2 | 186 |
| 44 | Utah | 10 | 0 | 0 | 4 | 0 | 14 |
| 45 | Vermont | 1 | 1 | 0 | 0 | 0 | 2 |
| 46 | Virginia | 2 | 0 | 1 | 9 | 0 | 12 |
| 47 | Washington | 5 | 0 | 3 | 26 | 0 | 34 |
| 48 | West Virginia | 1 | 0 | 1 | 1 | 0 | 3 |
| 49 | Wisconsin | 2 | 0 | 0 | 117 | 1 | 120 |
| 50 | Wyoming | 10 | 0 | 1 | 1 | 0 | 12 |
| 51 | Guam | 1 | 0 | 0 | 0 | 0 | 1 |
| 52 | Puerto Rico | 10 | 1 | 2 | 1 | 0 | 14 |
| 53 | Virgin Islands | 3 | 0 | 0 | 0 | 0 | 3 |
| | Totals | 625 | 101 | 123 | 1203 | 23 | 2075 |

In summary, the applicant's projects were divided into the following categories:

- 30% Wind Turbines
- 5% Solar
- 6% Meteorological Towers
- 58% Electrical Transmission
- 1% Miscellaneous

| KEY | |
|---|---|
| **Wind Turbine** | Wind powered, electricity generating turbines |
| **Solar** | Photovoltaic panels and concentrated solar towers |
| **MET** | Meteorological towers |
| **Transmission** | Power lines, transmission lines, utility lines |
| **Misc.** | Antennas, cranes, buildings, etc. |

## Appendix B
## List of Abbreviations

AFB – Air Force Base
ASR –Air Surveillance Radars
BLM – Bureau of Land Management
BOEM – Bureau of Ocean and Energy Management
BOD – Board of Directors
CA-OPR – California Governor's Office of Planning and Research
Clearinghouse – DoD Siting Clearinghouse
CY – Calendar Year
DASD (Readiness) – Deputy Assistant Secretary of Defense (Readiness)
DASR – Digital Airport Radar System
DFA – Development Focus Areas
DoD – Department of Defense
DOE – Department of Energy
DRECP – Desert Renewable Energy Conservation Plan
DUSD (I&E) – Deputy Under Secretary of Defense (Installations and Environment)
EMI – Electromagnetic Interference
FAA – Federal Aviation Administration
FERC – Federal Energy Regulation Commission
FY – Fiscal Year
G&G – Glint and Glare
HB – House Bill
HRAIZ – High Risk of Adverse Impact Zones
HVTL – High Voltage Transmission Lines
IFT&E – Interagency Field Test and Evaluation
INL – Idaho National Laboratory
JLUS – Joint Land Use Study
MCE – Mission Compatibility Evaluation
MILDEPs – Military Departments
MIT/LL – Massachusetts Institute of Technology/ Lincoln Laboratory
MOU – Memorandum of Understanding
MRT – Mitigation Response Team
MTRs – Military Training Routes
NAWS – Naval Air Weapons Station
NC-DENR – North Carolina Department of Environment and Natural Resources
NDAA – National Defense Authorization Act
NORAD – North American Aerospace Defense Command
NPH – Notice of Presumed Hazard
NWSTF – Naval Weapons System Training Facility
OEA – Office of Economic Adjustment
OSD – Office of the Secretary of Defense
R&D – Research and Development
REPI – Readiness and Environmental Protection Integration
ROTHR – Relocatable Over-The-Horizon Radar
TERPS – Terminal Instrument Procedures
TIM – Technical Interchange Meetings
TRMC – Test Resource Management Center