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**Eligibility of Generators under the Hazard Mitigation Grant Program (HMGP)**

**Frequently Asked Questions and Scenarios**

**(Companion piece to** “Eligibility of Generator Purchases under the Hazard Mitigation Grant Program” Memo, dated November 15, 2012)

**GENERAL ELIGIBILITY AND APPLICATION DEVELOPMENT**

1. **How is the Memo Different from Current Practice?**

The memo establishes that the purchase and installation of generators for the protection of critical facilities is an eligible, stand alone project type under the HMGP and is no longer limited only to the 5% Initiative. Generators that constitute a functional portion of an otherwise eligible mitigation solution (critical or not) remain eligible.

1. **Are Generators still Eligible under the 5% Initiative?**

Yes. If there is insufficient data to evaluate a generator project using a standard, HMA-approved BCA method, the project may be eligible under the 5% Initiative, as described in current HMA Unified Guidance. To perform this evaluation, a narrative description of the project’s cost-effectiveness must be provided in lieu of a BCA. However, when data is available to perform a standard, HMA-approved BCA, the standard method must be used.

1. **Are Eligible Critical Facilities Limited to those Listed in the November 15 Memorandum?**

No. The critical facilities listed in the November 15 Memorandum are not exhaustive. Eligible critical facilities are generally meant to include, but not be limited to, facilities such as Hospitals, Fire-Stations, Police Stations, Water and Waste-Water Treatment plants.

1. **Must the Generator be Permanently Installed in, or Anchored to, the Critical Facility or can it be Portable?**

Generators for a single facility or building should be permanently installed on site. Portable generators are eligible provided that they meet all HMGP requirements as described in **44 CFR §206.434, Eligibility**. The applicant must assure that the generator will be in place to protect the facility functions specified in the project application. The application should describe relevant transport, hook up and fuel supply and storage requirements at multiple facilities and how these will be executed if the generator is portable.

1. **Is the Purchase of Generators for Residential Structures an Eligible Activity?**

No. The purchase of a generator for the singular purpose of maintaining power for a single residential structure is not an eligible activity.

1. **If a Generator is required by Code, is the Purchase of a Generator for these Facilities Eligible?**

Yes, provided that the generator project meets all HMGP requirements as described in **44 CFR §206.434, Eligibility.**

1. **What Size Generator is Appropriate for a Facility?**

This will vary by facility and usage. It is not always necessary for the generator to support facility operations to their full capacity, but it should be sized appropriately to ensure the facility is able to provide uninterrupted critical functions in the event of future power outages.

1. **Is There a NEMIS Code for Generators as a Stand Alone Project Type?**

Yes. The new NEMIS code for standalone generator projects is **601.2 – Generator Regular**. The NEMIS code for generator projects as part of the 5 percent discretionary allowance is **601.1 – Generator.**

**COST-EFFECTIVENESS**

1. **Will FEMA Develop a Separate Benefit Cost Analysis (BCA) Module for Generators?**

No. A separate module is not necessary to perform the analysis. The Damage Frequency Assessment (DFA) module is able to perform this analysis for multiple hazards and project types. If problems are experienced in using the DFA module, contact the BC helpline at [bchelpline@fema.dhs.gov](file:///C%3A%5CUsers%5Cjspring2%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CTemporary%20Internet%20Files%5CContent.Outlook%5CFZNF6NI7%5Cbchelpline%40fema.dhs.gov).

1. **What are the Key Elements of a BCA for Generator Projects?**

Key inputs required are:

1. **Project Useful Life:** According to **OMB Circular A-76, Performance of Commercial Activities** the useful life for generators or generator sets is 19 years. This value can be utilized as the default useful life value when performing the BCA. It may be altered based on manufacturer warranty or other documentation that can demonstrate that the generator may be able to provide service for longer than 19 years. Analysts should utilize the 19 year project useful life first.
2. **Project Costs:** The cost of generators varies by size, installation and purpose. The generator’s size and specifications should be reasonable, appropriate and necessary to continuing critical functions of the facility. The exact costs for generators, installation and components should be provided by the subapplicant and included in the costs when performing the benefit cost analysis.
3. **Facility and Value of Service:** Analysis for facilities for potable water, waste water, police stations, fire stations and hospitals can be quickly performed using FEMA’s benefit cost toolkit and the DFA module which provides service values for these facilities. To use these values, the analyst will need some information regarding the population served by the facility. For example, if a generator is to be installed at a waste water treatment plant, the analyst will need to know how many customers are served by the facility as well as how many days the facility was not able to operate due to power failure. These values can typically be obtained from the facility manager and can be provided on official letterhead for documentation purposes.
4. **Recurrence Determination:** Recurrence information used in the analysis may vary by location or by cause of power failure, such as wind or flood. See FAQ #17 for additional information.
5. **Other Benefits:** Other benefits (or costs avoided) may be included if they are addressed by the generator project.
6. **What Information is needed to perform a BCA for Generator Projects?** Information needed for performing the benefit cost analysis will vary by facility. However, the following inputs are **required** to run the BCA module:
	1. For **all BCAs** performed, the subapplicant must provide the following:
7. The total project cost
8. Useful life (19 years for generators)
9. Estimated yearly maintenance costs
10. The frequency of the event which is used in analysis which would cause a power failure demonstrating the need for a backup power source (generator)
11. The number of days that service was effected (without power)

To calculate the value of services (benefits to society), the following inputs **must** be included for each specified facility type:

* 1. For **Water or Waste Water Services**:
1. Number of customers impacted by the power outage at the treatment plants
	1. For **Hospitals**
2. The number of people served by the hospital
3. The distance in miles between the hospital being analyzed and the hospital that would treat these people in the event the hospital was inoperative
4. How many people normally served by the alternate hospital
	1. For **Police Stations**
5. Is the station Metropolitan, City or Rural
6. How many people are served by the police station
7. How many officers work at the station and would serve the same area if the station were shut down due to disaster
	1. For **Fire Stations**
8. How many people served by the station
9. The type of area served by the fire station (urban, suburban, rural, wilderness)
10. What is the distance in miles to nearest fire station that would provide protection for the area normally served by the fire station effected
11. Does the fire station provide Emergency Medical Services

Value of service for hospitals, police, and fire stations are in the DFA module by selecting Non Residential Buildings for the Facility Type for Loss of Function in the DFA modules as shown in the screen shots below.



1. **Are the Benefits Limited to Damages Avoided to the Facility?**

No, benefits are not limited to just damages avoided. The value of service for critical facilities can be used to demonstrate cost effectiveness. The value of services for critical infrastructure and facilities are included in the benefit cost toolkit available at <http://www.fema.gov/benefit-cost-analysis>. All costs associated with power failure that would be mitigated by a generator should be considered.

Additional losses can be included in the benefit cost analysis if those losses are a direct result of interrupted power service that a generator would have mitigated. For waste water treatment plants, there are sometimes additional costs to bring the facility back to operating status after an extended power failure. This may include removal of sludge in equipment or additional man hours needed to bring the facility back to operational status. Those additional costs can be included above and beyond the value of service costs if a generator would have prevented those additional costs.

1. **Can an Applicant Consider Multiple Hazards in the Benefit Cost Analysis?**

Yes. Multiple hazards may disrupt power supply. The applicant will need to provide the frequency of each hazard used in its analysis.

1. **How Does an Applicant Develop the Return Interval for an Event Requiring the Use of a Generator?**

The recurrence interval used in the analysis will depend on the hazard that caused or will cause the facility to lose power. For example, in the NYC metropolitan area, winds of 85 MPH could equate to a 25 year recurrence interval. For other hazards, such as extreme snow fall, information about prior snow fall totals could be validated to estimate the recurrence interval. Recurrence interval data can be obtained from a number of sources such as the National Weather Service for rainfall and ice storms and the U.S. Geological Survey for floods. If there are three or more past events in which power failure occurred, the DFA module can calculate the recurrence interval based on the years of the event.  Question #17 provides some useful tools to assist in frequency determination.

Generally, 2 events are required to perform the analysis. Applicants/subapplicants are encouraged to provide as much historical damage information as they can. Projects submitted with 1 frequency will be considered acceptable.

1. **In the Case of a Water Treatment Plant, is the Cost of Providing Temporary Water or other emergency protective measures considered a Benefit or future cost avoided?**

Yes. If the generator will negate the need for temporary water in the future, then those costs should be included in the analysis.

1. **Are Environmental Benefits included in the BCA Analysis?**

To the extent they can be captured and justified, environmental costs associated with raw sewage discharge can be included in the BC Analysis for wastewater treatment plants. FEMA does not have a default value for these associated costs, and these costs will vary by location. The applicant/ subapplicant should include all reasonable costs that will be mitigated by having a backup generator installed at a facility.

1. **What Resources are Available to Determine Recurrence Interval Values?**

Recurrence intervals may be determined by using some of the tools provided below:

* If the facility lost power due to wind damage to power lines feeding the facility, the analyst can utilize the Advanced Technology Council Wind Speed tool available at <http://www.atcouncil.org/windspeed/index.php> to determine the frequency of the coastal wind event.
* If power outages are attributed to flooding, recurrence information for the flooding event should be used in the analysis. The National Weather Services provides the Precipitation Frequency Data Server at <http://hdsc.nws.noaa.gov/hdsc/pfds/> which can be utilized to establish a frequency for various precipitation events.
* USGS stream gauge data can also be used to extrapolate frequency information for flood events, details of which can be found in the *Supplement to the Benefit-Cost Analysis Reference Guide* in the FEMA library at <http://www.fema.gov/library/viewRecord.do?id=4830>.
* National Snow and Ice Data Center (NASA, NOAA, NSF) at <http://nsidc.org/data/search/data-search.html>
* Insurance claims, BureauNet/Simple and Quick Assessment (SQA) Net information, damage repair records, or data from the State/local agency, local government Newspaper accounts citing credible sources (other than homeowner accounts) could be used in conjunction with the DFA modules unknown frequency calculator. Using this method may require more time as three events are required for analysis.

**18. How should EOCs be valuated for inclusion in the Benefit-Cost Analysis toolkit?**

It is difficult to find the value (in loss of service terms) of a State Emergency Operation Center (SEOC) in order to prove cost-effectiveness of a generator project.  We are open to allowing reasonable and justified ‘loss of service’ costs for State and local EOCs that are identified by the Grantee to be entered into the DFA module to evaluate cost-effectiveness of an EOC generator project.  Another or additional option is to investigate the costs of remobilizing an EOC to an alternate/COOP location that could be avoided should the EOC be supplied with an uninterruptible power source such as a generator.

**SCENARIOS**

Different power failure scenarios at various facilities are outlined below. For analysis purposes, each facility was reviewed using a four days of loss of service due to power failure at the 25 year recurrence. The 25 year recurrence interval for the test cases is based on observed wind speeds and the frequency was extrapolated using the ATC Council Wind Speed tool for the New York metropolitan area. Other project locations should use the appropriate recurrence intervals for the hazard being mitigated. Analysis was performed using the Damage Frequency Assessment module in the Benefit Cost Toolkit. Please note the case studies below are for demonstration purposes only. Dollar amounts and frequency intervals were chosen for comparison purposes only . Analysts should use the appropriate values for the facility being examined. For those performing the analysis, assistance is available through the benefit cost helpline which can be reached at bchelpline@fema.dhs.gov or at 1-855-540-6744. The helpline is not allowed to perform or review analysis but can provide assistance to specific questions regarding methodologies. When performing the benefit cost analysis, inputs used in the module should be document, as with all analysis. Documentation sources may include, but are not limited to correspondence with facility or site managers, data available from the county or facility website, information from other government websites, media releases, engineering analysis, and letters from the facility manager. Discussion of data documentation is available in the benefit cost analysis training materials available on FEMA.gov. There are no special or extraordinary data documentation requirements for this project type.

**Scenario 1: The Purchase and Installation of a Generator at an Urban Police Station**

Assumptions:

* The police station has 119 officers who serve up to 27,000 residents
* The police station loses power and the efficiency of the police station drops to 50% (assumes 50% of the force are working out of other facilities or within the community)
* The power is not fully restored for four days
* The project useful life for the generator is 19 years
* The project cost is $50,000

Benefit Cost Ratio:

* The resulting benefit-cost ratio (BCR) is 1.23

**Scenario 2: The Purchase and Installation of a Generator at an Urban Fire Station**

Assumptions:

* The fire station has 119 firefighters who serve up to 27,000 residents
* The fire station loses power and the efficiency of the fire station drops to 50%
* The power is not fully restored for four days
* The project useful life for the generator is 19 years
* The project cost is $50,000

Benefit Cost Ratio:

* The resulting benefit-cost ratio (BCR) is 0.80

**Scenario 3: The Purchase and Installation of a Generator at an Urban Hospital**

Assumptions:

* The hospital serves up to 27,000 residents
* The power is not fully restored for four days
* The project useful life for the generator is 19 years
* The project cost is $200,000

Benefit Cost Ratio:

* The resulting benefit-cost ratio (BCR) is 1.0

**Scenario 4: The Purchase and Installation of a Generator at a Rural Area Water Treatment Plant (Potable Water)**

Assumptions:

* The water treatment plant serves up to 15,000 customers
* The plant loses power for three days
* A 100 year recurrence interval is used
* The project cost is $200,000

Benefit Cost Ratio

* The resulting benefit-cost ratio (BCR) is 1.05

**Scenario 5: The Purchase and Installation of a Generator at an Urban Area Waste Water Treatment Plant**

Assumptions:

* The waste water treatment plant serves up to 500,000 residents
* The waste water treatment plant loses power and there is no service
* The power is not fully restored for four days
* The project useful life for the generator is 19 years. The project cost is $1,500,000

Benefit Cost Ratio:

* The resulting benefit-cost ratio (BCR) is 24.8