SESSION 4

GUIDING PRINCIPLES COMPLIANCE FOR NEW CONSTRUCTION PROGRAM

PRESENTED BY MICAH THOMAS

LEARNING OBJECTIVES:

- Identify the Guiding Principles
- Demonstrate understanding of the specific items assessed within each category
- Understand documentation required to demonstrate compliance

Guiding Principles Environmental Assessment Areas

GBI's Guiding Principles Compliance for New Construction Program includes assessment of the five Guiding Principles.

I. Employ Integrated Assessment, Operation, and Management Principles

II. Optimize Energy Performance

III. Protect and Conserve Water

IV. Enhance Indoor Environmental Quality

V. Reduce Environmental Impact of Materials

ENVIRONMENTAL ASSESSMENT AREAS

1. EMPLOY INTEGRATED DESIGN PRINCIPLES

A. Integrated Design and Operation

1. Consider the environmental impact of siting decisions and use an integrated project team to:

a. Establish energy and other environmental performance goals in the design process;

b. Follow sustainable landscape design principles;

c. Evaluate electric vehicle charging needs

d. Consider design choices that improve environmental performance, support health and wellness of building occupants and consider climate risks including wildfire

e. Consider all stages of the building's life cycle.

- *Suggested Compliance:*
  - o Integrated Process: Conceptual and final design reports demonstrate that:
  - o ASHRAE 189.1 Appendix F Integrated Design Section F1 (excludingF1.1.2) was followed;
  - o That final building design was developed through an integrated team and design process; AND
  - o Integrated Team: Documents such as team charters, agendas and meeting minutes demonstrate the names and roles of the integrated team members; AND
  - o Design Considerations: Conceptual and final design reports or Owner's Project Requirements demonstrate that the integrated process considered, at a minimum, the items listed in this Guiding Principle.

B. Commissioning

1. Commission and recommission at least every 4 years to optimize building performance using commissioning agents who are independent of the design and construction or operating team.

- *Suggested Compliance*
  - o Follow ASHRAE Standard 189.1 Section 10.3.1.2 Building Project Commissioning or ASHRAE Standard 202-2013, Commissioning for Building and Systems OR
  - o Conduct commissioning in accordance with generally accepted engineering standards, guidelines and nationally recognized organizations and programs such as:
    - ASHRAE Guidelines 0-2013, The Commissioning Process
    - U.S. DOE's Commissioning for Federal Facilities
    - LEED
    - Green Globes
    - Building Commissioning Association
  - o AND the final commissioning report demonstrates:
    - Consistency with EISA, Section 432, Management of Energy and Water Efficiency in federal buildings; AND
    - That commissioning was performed by an in-house or external commissioning provider who is independent of the design and construction or operating team: AND
    - That commissioning occurred no longer than two years prior to the date when a building meets the Guiding Principles.

2. OPTIMIZE ENERGY PERFORMANCE

A. Energy Efficiency

1. For new construction, ensure energy efficiency is 30% better than the current American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 90.1 standard, OR

2. For modernization, ensure:

a. Energy Use is 20% below the fiscal year (FY) 2015 energy use baseline, OR

b. Energy use is 30% below the FY 2003 energy use baseline, OR

c. The building has an ENERGY STAR® of 75 or higher, OR

d. For building types not in ENERGY STAR Portfolio Manager, where adequate benchmarking data exists, the building is in the top quartile of energy performance for its building type, AND

e. For new construction and modernization, use energy efficient products, as required by statute.

- *Suggested Compliance*
  - o 30% Better ASHRAE: Energy modeling results demonstrate that energy efficiency in the existing building is 30% better than a baseline case modeled to the current ASHRAE 90.1 (the current version is ASHRAE 90.1 – 2013) as codified by 10 CFR 433; OR, if the building is a low rise residential building, 30% better than a baseline case modeled to the current IEEC (the current version is IECC 2009) as codified by 10 CFR 435; OR
  - o LCCE Improvement: If a 30% reduction is not life-cycle cost-effective (LCCE), energy modeling results demonstrate the highest level of energy efficiency that is cost effective above a baseline case modeled to the current ASHRAE 90.1 or IECC; AND
  - o Methodology: Methods, calculations and computer programs used to determine LCCE energy savings are identified; AND
  - o 3rd party option: If a building is participating in a 3rd party green building certification program, verify that energy savings were determined following 10 CFR 433 or 435 requirements: AND
  - o Efficient Products: Final design documents or cut sheets or contracts demonstrate, as required by 42 U.S.C § 8259b (b), the purchase of ENERGY STAR and FEMP-designated products for all products for which there is an ENERGY STAR label or FEMP-designation, when cost effective over the life of the product, reasonably available and meets functional requirements; OR
  - o Final design documents, cut sheets or product declarations, or contracts demonstrate ASHRAE 189.1-2014 sections 7.4.7.3.1 and 7.4.7.3.2 were followed, when cost effective over the life of the product, reasonably available and meets functional requirements; AND
  - o Policy: A policy demonstrates that purchases are required to be ENERGY STAR and FEMP-designated.

B. Renewable and Clean Energy

1. Evaluate and implement, where appropriate, life cycle cost-effective renewable energy projects on-site; consider long-term off-site renewable sources and Renewable Energy Certificates (RECs); and utilize clean and alternative energy where possible.

- *Suggested Compliance*
  - o RE Design ASHRAE: Final design or construction documents demonstrate ASHRAE Standard 189.1 Section 7.4.1.1 On-Site Renewable System was followed; OR
  - o RE On Building/Federal Property: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate agency-owned renewable energy or Power Purchase Agreements for RE on federal property or from federal property. Agency must own RECs. If taking credit for a centralized system demonstrate RE percentage attributed to the building. OR

- RE Off-Site: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate Power Purchase Agreements for RE or green power purchased from the utility; demonstrate RE percentage for federal use attributed to the building. Agency must own RECs OR
- AE System: Final design or construction documents, utility records, agreements, contracts, or photos demonstrate there is an alternative energy system on the building, or the building is served by a district alternative energy system; OR
- RECs: Demonstrate that RECs are purchased for a term of at least 2 years; OR
- LCCA: Analyses demonstrates that renewable or alternative energy is not life-cycle cost effective.

C. Metering

1. Install building level meters for electricity, natural gas and steam; install advanced or standard meters as appropriate.

- *Suggested Compliance*
  - Documents such as utility bills or photos demonstrate the installation and location of building-level standard meters for electricity, natural gas and steam (when these are present in a building); OR
  - When installing new meters, documents demonstrate the installation and location of building-level advanced meters per U.S.C 42 § 8253, to the maximum extent practicable, that provide data at least daily and that measure at least hourly consumption for electricity, natural gas and steam (where these are present in a building).

D. Benchmarking

1. Benchmark building performance at least annually, preferably using ENERGY STAR Portfolio Manager; regularly monitor building energy performance against performance data and peer buildings.

- *Suggested Compliance*
  - ASHRAE: Documents demonstrate ASHRAE Standard 189.1 Section 10.3.2.1.3.2 (b) Track Energy Performance; OR
  - ENERGY STAR Record: Documents demonstrate that an ENERGY STAR Portfolio Manager record has been created for the designated building (If 12 mos. of post-occupancy energy consumption data is unavailable at the time the record is created, it may consist of only basic building information and property uses).

3. PROTECT AND CONSERVE WATER

A. Indoor Water Use

1. Build to ASHRAE standard 189.1-2014 sections 6.3.2, 6.4.2, and 6.4.3, or current comparable ASHRAE standards, AND
2. Use water-efficient products; install building level water meters; optimize cooling tower operations; and eliminate single pass cooling.

- *Suggested Compliance*
  - o ASHRAE: Final design or construction documents specify ASHRAE standard 189.1-2014 sections 6.3.2, 6.4.2, and 6.4.3 or comparable (water efficient products can be WaterSense or products with performance equivalent to WaterSense); AND
  - o Meter: Final design or construction documents specify, at a minimum, a meter/s exclusive to the building measuring whole-building potable water consumption (must include all potable water sources), preferably with advanced data management capabilities for remote data access, electronic data storage and reporting, and the collection of interval data (hourly, at a minimum); AND
  - o Product specifications: Compile cut sheet or product declarations or plumbing fixture and fittings schedule showing flush or flow rate performance consistent with ASHRAE 189.1 2014 section 6.3.2. or WaterSense or equivalent.

B. Outdoor Water Use

1. Separately meter water for irrigation systems greater than 25,000 square feet, AND
2. Use water efficient landscapes, AND
3. Limit potable water use for irrigation to 50% or more below conventional practices using methodologies from (but not the numeric requirements contained in) ASHRAE standard 189.1-2014 section 6.5.1, or current comparable ASHRAE standards, to calculate water use of conventional practices.

- *Suggested Compliance*
  - o No Irrigation: Document that there is no irrigation; OR
  - o Meter: Where irrigation systems serve more than 25,000 square feet of landscape, document/s (utility invoices, etc.) demonstrate, at a minimum, a meter exclusive to the irrigation system, preferably with advanced data management capabilities for remote data access, electronic data storage and reporting, and the collection of interval data (hourly, at a minimum); OR
  - o No Meter: Irrigation systems that serve less than 25,000 square feet do not require a meter; AND

- o Efficient Landscaping: Document/s demonstrate the use of water efficient landscaping and non-invasive plant species for, at a minimum 60%*of areas that will be/are landscaped. AND
- o 50% < Conventional: Documented analyses using shows that the long-term irrigation system uses at most half of the amount of potable water used in conventional practices.

C. Alternative Water

1. Consider alternative sources of water where cost-effective and permitted by local laws and regulations.

- *Suggested Compliance*
  - o Document that alternative water options were evaluated and implemented.

D. Stormwater Management

1. For new construction, meet or exceed EISA section 438 stormwater management requirements.

- *Suggested Compliance*
  - o Documents demonstrate that EISA stormwater management requirements have been met or exceeded.
  - o Stormwater Management Examples:
    - Reduced impervious surfaces
    - Pervious paving materials
    - Bio-swales
    - On-site filtration
    - Rain garden
    - Green roofs
    - Retention ponds and rainwater collection systems

4. ENHANCE INDOOR ENVIRONMENTAL QUALITY

A. Ventilation and Thermal Comfort

1. Meet current ASHRAE standards 55 and either 62.1 or 62.2 for ventilation and thermal comfort.

a. ASHRAE 62.1 establishes the minimum requirements for ventilation air rates in various types of spaces, so as to reduce the potential for adverse health effects.

b. ASHRAE 55 defines the range of indoor thermal environmental conditions acceptable to a majority of occupants to provide comfort.

- *Suggested Compliance*
  - o Documents demonstrate that a Professional Engineer or Registered Architect, or other skilled building professional with relevant experience has determined that the building performs according to the versions of these ASHRAE Standards that are current or are current at the time of establishing the building's code of record:

B. Commissioning

1. Commission and recommission at least every 4 years to optimize building performance using commissioning agents who are independent of the design and construction or operating team.

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b. ASHRAE 55 defines the range of indoor thermal environmental conditions acceptable to a majority of occupants to provide comfort.

- *Suggested Compliance*
  - o Documents demonstrate that a Professional Engineer or Registered Architect, or other skilled building professional with relevant experience has determined that the building performs according to the versions of these ASHRAE Standards that are current or are current at the time of establishing the building's code of record:

- 62.1 Ventilation for Acceptable Indoor Air Quality, or 62.2 Ventilation for Acceptable Indoor Air Quality and 55 -2013 Thermal Environmental Conditions for Human Occupancy; OR
- 189.1. – 2014 Sections. 8.3.1 Indoor Air Quality and Section 8.3.2 Thermal Environmental Conditions for Human Occupancy.

B. Daylighting and Lighting Controls

1. Maximize opportunities for daylighting in regularly occupied space, automatic dimming controls or accessible manual controls, task lighting and share and glare control.

- *Suggested Compliance*
  - Daylighting and lighting plans or other documents demonstrate that:
  - Passive strategies: The building was designed, where feasible, to best orient the building to allow for passive solar strategies and to improve daylight penetration and distribution; AND
  - ASHRAE lighting quality: The building meets ASHRAE Standard 189.1 Section 8.3.5 Lighting Quality; AND
  - ASHRAE daylighting: The building meets ASHRAE Standard 8.4.1 Daylighting; OR
  - Exterior wall windows: All regularly occupied spaces located on the exterior wall should have vision fenestration and shade or glare control unless daylighting impedes mission; AND
  - Lighting controls: Provide automatic dimming or accessible manual controls and task lighting in accordance with UFC 3-530-01, Design: Interior and Exterior Lighting and Controls

C. Indoor Air Quality

1. Develop and implement an indoor air quality policy that considers the following: moisture control, use of low emitting materials and products with low pollutant emissions, necessary protocols to protect indoor air quality during construction and in the finished building, prohibition of smoking in any form inside and within 25 feet of all building entrances, operable windows, and building ventilation intakes, and use of integrated pest management techniques.

- *Suggested Compliance*
  - Conceptual and final design or construction reports demonstrate:
  - ASHRAE moisture control: ASHRAE 189.1 Section 10.3.1.5 Moisture Control; OR
  - ASHRAE 90.1: ASHRAE 90.1 with local/regional amendments that impact moisture control or indoor air quality; AND
  - ASHRAE 62.1 or 62.2: Ventilation for Acceptable Indoor Air Quality; AND
  - ASHRAE 55: Thermal Environmental Conditions for Human Occupancy; AND
  - Commissioning: Building commissioning has occurred; AND
  - Protect Materials: That absorptive materials and all materials stored on-site are protected from moisture damage and that no materials showing visible evidence of mold are installed.

2. Use of Low Emitting Materials & Products

- *Suggested Compliance*
  - o Final design reports or operations and maintenance documents demonstrate that one of the following was followed:
  - o ASHRAE Standard 189.1 Section 10.3.1.4 Indoor Air Quality (IAQ) Construction Management; OR
  - o A set of specific procedures used to protect and ensure the indoor air quality during construction, building renovations or repairs; OR
  - o For renovation of occupied existing buildings, comply with ANSI SMACNA 008-2008, 2nd Edition, SMACNA IAQ Guidelines for Occupied Buildings Under Construction.

3. Tobacco Smoke Control

- *Suggested Compliance*
  - o Final design reports or maintenance and operations documents demonstrate that:
  - o Prohibit Smoking ASHRAE: Meet ASHRAE 189.1 Section 8.3.1.4 Environmental Tobacco Smoke; OR
  - o Smoking is prohibited within 25 feet of all building entrances, operable windows, and building ventilation intakes; AND
  - o Signage: Post signage as appropriate.

4. Integrated Pest Management

- *Suggested Compliance*
  - o IPM Plan: A plan demonstrates a commitment to or the existence of the following pest management techniques:
  - o An IPM team (may be third party) with defined team roles;
  - o A plan to identify and monitor pests;
  - o Thresholds for taking pest control actions;
  - o Methods to be used for each pest when action thresholds are exceeded;
  - o Non-chemical pest controls methods that are low-risk to the applicator, building occupants and the environment compared to other options;
  - o Application of least-risk EPA-registered pesticides only when non-chemical approaches fail;
  - o A reporting mechanism by which building occupants can report pest problems;
  - o Notification of application of pesticides whey they are not least-risk, if requested by a building occupant.

D. Occupant Health and Wellness

1. Promote opportunities for voluntary increased physical movement of building occupants such as making stairwells an option for circulation, active workstations, fitness centers and bicycle commuter facilities; and support convenient access to healthy dining options, potable water, daylight, plants, and exterior views.

- *Suggested Compliance*
  - o Documents demonstrate at least two of these eleven items:
  - o Active Design Principles for Staircases:
    - Examples include conveniently locating them and making them visibly appealing and comfortable, and signage to encourage use of stairs; OR
    - Active design principles for staircases, such as a convenient location, comfortability, safety and visual appeal, and signage to encourage use of stairs or staircases are accessible to regular building occupants during all regular business hours and regularly used to travel between floor.
  - o Active Workstations: For 50% of work stations. Examples include but are not limited to treadmill or bicycle desks, adjustable standup desks, standing mats that encourage movement, and desks with active sitting chairs.
  - o Fitness Center: Should be in the building or on-site and offer cardiovascular and weight training exercise opportunities available to majority of occupants (excluding visitors).
  - o Bicycle Commuter Facilities: Bike storage for regular occupants and visitors and onsite shower/s with changing facilities for regular building occupants.
  - o Daylighting and Glare Control: Daylighting is available in a majority of occupied spaces (excluding spaces where daylighting would hinder work performed or mission) and there are glare control devices for all transparent glazing in regularly occupied spaces.
  - o Exterior Views: For a majority of all regularly occupied spaces, a direct line of site to exterior views unimpeded by glazing features such as patterned glazing or tint.
  - o Healthy Dining: A cafeteria (in building or on-site) that supports offering a variety of fresh food options, or the building is located within walking distance of fresh food options.
  - o Corporate Wellness Plans: Activity incentive programs such as reimbursement of gym memberships or corporate wellness plans that offer incentives and subsidies for physical activity available to all employees.
  - o Onsite Fitness Programs: Structured, reoccurring onsite fitness and training programs or related education available to all employees.
  - o Outdoor Walking Opportunities: Trails or tracks adjacent or close to the building.
  - o Other: Any other exercise or fitness opportunities.

5. REDUCE ENVIRONMENTAL IMPACT OF MATERIALS

A. Material Content and Performance

1. Reduce the Environmental Impact of Materials: Material Content and Performance

a. Procure products that meet the following requirements where applicable:

1. RCRA section 6002, AND
2. FSRIA section 9002, AND
3. Federally Recommended Specifications, Standards and Ecolabels or are on the Federal Green Procurement Compilation for other green products, as appropriate, AND
4. Avoid ozone depleting compounds and high GWP chemicals.

- *Suggested Compliance*
  - o ASHRAE: Conceptual and final design reports demonstrate ASHRAE 189.1 Section 9.4.1.1 Recycled Content and Salvaged Material Content, Section 9.4.1.3 Biobased Products, Section 9.4.1.4 Multiple-Attribute Product Declaration or Certification, and ASHRAE 189.1 Section 9.3.3 Refrigerants; OR
  - o Product Specifications: Building design and purchasing specifications, procurement documents, product disclosure declarations and/or contracts specifically require:
  - o Recycled & Biobased content per RCRA and FSRIA;
  - o Ecolabels: Products that use Federal ecolabels. If no statutory mandate or EPA standard, then documents demonstrate the purchase of products using non-federal labels;
  - o Ozone Depleting Compounds: To the maximum extent practicable, no ozone depleting compounds and high GWP chemicals where EPA's SNAP has identified acceptable substitutes or where other environmentally preferable products are available.

B. Waste Diversion

1. Where the markets exist, provide reuse and recycling services for building occupants and divert at least 50% of non-hazardous non-construction related materials from landfills.

- *Suggested Compliance*
  - o Design documents demonstrate the inclusion of sufficient infrastructure to stage materials for salvage, reuse and recycling.
  - o If a diversion rate of 50% cannot be met because markets don't exist:
  - o Divert 50% of what can be diverted
  - o Focus on reducing waste at the point of generation
  - o Monitor markets for available streams

C. Materials Management

1. Where the markets exist, divert at least 50% of construction and demolition materials from landfills.

- *Suggested Compliance*
  - o Have in place a policy to divert construction and demolition waste.
  - o If construction occurs, document tonnage diverted from landfill.

6. ASSESS AND CONSIDER CLIMATE CHANGE RISKS

A. Materials Management

1. Assess potential impacts and vulnerabilities, from both acute weather events and chronic climate changes, to inform the design of new construction and modernization and facility operations to increase climate resilience, including:

a. Mission Criticality (HQ)

b. Floodplain Considerations

c. Facility Design

d. Facility Adaptation