The Detroit Edison Company
One Energy Plaza, Detroit, MI 48226-1279

10 CFR 52.79

November 16, 2009
NRC3-09-0043

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington DC 20555-0001

References: 1) Fermi 3
Docket No. 52-033
2) Letter from Peter W. Smith (Detroit Edison) to USNRC, "Detroit Edison Company Submittal of Final Safety Analysis Report (FSAR) and Emergency Plan Changes Associated with Revised Fermi 3 Site Plan," NRC3-09-0020, dated August 26, 2009

Subject: Detroit Edison Company Submittal of Combined License Application (COLA) Changes Associated with Revised Fermi 3 Site Plan

In Reference 2, Detroit Edison submitted changes to the Fermi 3 COLA associated with the revised site plan. As part of the revised site plan, it was necessary to relocate the exiting Fermi 2 meteorological tower and evaluation of the new location has been completed. Changes to the Fermi 3 COLA that reflect the relocation of the meteorological tower are described below:

- Attachment 1 provides a summary of the changes and markups of the affected Fermi 3 FSAR pages. Please note that the changes made in the marked-up FSAR pages also include those made in Reference 2. These changes will be included in the next Fermi 3 COLA revision.
- Attachment 2 provides markups of the affected Fermi 3 Emergency Plan pages. The changes to the Emergency Plan consist of revisions to a figure depicting the site layout and do not result in any substantive emergency response related changes.
- Changes to the Fermi 3 Environmental Report will be addressed through responses to associated Requests for Additional Information (RAIs).
- No changes to the Fermi Site Security Plan were identified.

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If you have any questions, or need additional information, please contact me at (313)235-3341.

I state under penalty of perjury that the foregoing is true and correct. Executed on the 16th day of November, 2009.

Sincerely,

Peter W. Smith, Director
Nuclear Development – Licensing & Engineering
Detroit Edison Company

Attachments: 1) Summary of Fermi 3 FSAR Changes & Fermi 3 FSAR Markup
2) Fermi 3 Emergency Plan Markup

cc: Jerry Hale , NRC Fermi 3 Project Manager
Ilka Berrios, NRC Fermi 3 Project Manager
Bruce Olson, NRC Fermi 3 Environmental Project Manager
Fermi 2 Resident Inspector
NRC Region III Regional Administrator
NRC Region II Regional Administrator
Supervisor, Electric Operators, Michigan Public Service Commission
Michigan Department of Environmental Quality
Radiological Protection and Medical Waste Section

Attachment 1
NRC3-09-0043

Summary of Fermi 3 FSAR Changes & Fermi 3 FSAR Markup

Summary of Fermi 3 FSAR Changes

A review of the Fermi 3 FSAR was conducted to determine the impacts to the FSAR from the relocation of the onsite meteorological tower. These resultant impacts are summarized in the table below.

FSAR Chapter	Sections Impacted	Topics	Comments
2	Figure 2.1-204	Fermi 3 Site Plan	Figure revised to include new location of meteorological tower.
	2.3.2.2	Influence of Fermi 3 and Its Facilities on Local Meteorology	Text revised to describe the impacts of structures on both current and new meteorological towers.
	2.3.2.2.1	Cooling Tower Plumes	Text revised to address effects of Natural Draft Cooling Cooling Tower (NDCT) plumes on current and new meteorological towers.
	2.3.2.2.2	Cooling Tower Plume Effects on Ground Level Meteorological Variables	Text revised to address effects of the NDCT on wind measurements.
	2.3.3	Meteorological Monitoring	Revised text to describe the current and future meteorological monitoring programs.
	2.3.3.1	Fermi 3 Preapplication Meteorological Monitoring Program	Revised title of section.
	2.3.3.1.1	Tower and Instrument Siting	Revised text to describe location of new meteorological tower.

FSAR Chapter	Sections Impacted	Topics	Comments
2	2.3.3.2	Fermi 3 Construction, Pre-Operational, and Operational Onsite Meteorological Monitoring Program	Added new section to describe new meteorological tower.
	2.3.3.2.1	Tower and Instrument Siting	Added new section to describe new meteorological tower.
	2.3.3.2.2	Instrumentation	Added new section to describe new meteorological tower.
	2.3.3.2.3	Instrument Calibration, Service, and Maintenance	Added new section to describe new meteorological tower.
	2.3.3.2.4	Data Reduction, Transmission, Acquisition, and Processing	Added new section to describe new meteorological tower.
	Table 2.3-289	Accuracies and Thresholds for the Fermi Onsite Meteorological Monitoring Instruments	Revised name of wind sensor manufacturer.

Markup of Fermi 3 FSAR
(Following 18 pages)

The attached markup represents Detroit Edison's good faith effort to show how the COLA will be revised in a future COLA submittal. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAI's, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different that as presented herein.

Figure 2.1-204 Fermi 3 Site Plan

[EF3 COL 2.0-2-A]

thus will not represent a significant alteration to the flat and gently sloping topographic character of the Fermi region. Additionally, construction of new roads to accommodate the construction traffic for the new facility and the addition of buildings, parking areas and other structures should have little to no effect on the local meteorology of the site.

Estimated Impacts of New Structures

The addition of a NDCT, two multi-cell MDCTs, and reactor building will add additional effects to the airflow trajectories downwind of the new structures. Regulatory Guide 1.23 estimates that a meteorological tower located at least a distance of 10-building-heights horizontal distance downwind from the nearest structure will not have adverse wake effects exerted by the structure. ~~Figure 2.1-204 of Section 2.1 provides the location of the proposed NDCT, two multi-cell MDCTs, and reactor building in relation to the current onsite meteorological tower. The Fermi site according to Figure 2.3-258 is located at an elevation approximately 177.7 m (583 ft) above mean sea level. The plant area where the structures will be located is relatively flat with only minor differences in plant grade. The two multi-cell MDCTs are located approximately 426.1 m (1398 ft) east of the onsite meteorological tower. Since most of the cooling tower is located behind the Operation Support Center, turbulent flow downwind of the MDCTs is expected to be minimal. The reactor building is located approximately 339.2 m (1113 ft) east-northeast of the onsite meteorological tower. The height of the reactor building is approximately 48.2 m (158 ft) above plant grade. Using the method suggested by Regulatory Guide 1.23 the zone of turbulent flow created by the reactor building will be limited to approximately 481.6 m (1580 ft). Since the meteorological tower is within a distance of approximately 339.2 m (1113 ft), the reactor building will produce adverse wake effects on the wind direction and speed measurements at the Fermi site when winds blow from the east through northeast directions.~~

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The NDCT ~~is located approximately 1359 ft (414 m) southwest of the~~ onsite meteorological tower and will be built to a height of 182.3 m (600 ft) above plant grade, the tallest structure at the Fermi site. ~~Since the NDCT is hyperbolically-shaped, the downwind wake zone is different than square or rectangular structures and is estimated to be approximately five times the width of the tower at the top of the structure (Reference 2.3-253). Using this method with a width of 89 m (292 ft) at the top of the tower, the downwind wake effect of the NDCT is estimated~~

for Fermi 3 will be constructed in the location of the current

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The NDCT for Fermi 3 will be built in the approximate location of the current onsite meteorological tower. Thus, a new meteorological tower will be erected in the southeast corner of the Fermi site prior to construction of Fermi 3. Figure 2.1-204 of Section 2.1 provides the location of the NDCT, two multi-cell MDCTs, and reactor building in relation to the new onsite meteorological tower. The Fermi site according to Figure 2.3-258 is located at an elevation approximately 177.7 m (583 ft.) above mean sea level. The plant area where the structures will be located is relatively flat with only minor differences in plant grade. The two multi-cell MDCTs are located approximately 1235.5 m (4054 ft.) north of the new onsite meteorological tower and at a distance that will not affect wind measurements at the new meteorological tower. The reactor building is located approximately 1341.1 m (4400 ft.) north-northwest of the new onsite meteorological tower. The height of the reactor building is approximately 48.2 m (158 ft.) above plant grade. Using the method suggested by Regulatory Guide 1.23 the zone of turbulent flow created by the reactor building will be limited to approximately 481.6 m (1580 ft.). Since the new meteorological tower will be at a distance of approximately 1341.1 m (4400 ft.), the reactor building will not produce adverse wake effects on the wind direction and speed measurements at the new meteorological tower when winds blow from the north through north-northwest directions.

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The NDCT is hyperbolically shaped and has a maximum width at the base of the tower, which has an outer diameter of 140.2 m (460 ft.). The downwind wake zone for hyperbolically shaped and sloping structures is expected to be smaller than for structures that are square or rectangular and have sharp edges. 40 CFR 51.100(ii)(3) defines good engineering practices (GEP) stack height as that which ensures that emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures, or nearby terrain features. "Nearby structures" is defined in 40 CFR 51.100(jj)(1) as that distance up to five times the lesser of the height or width dimension of a structure. Furthermore, the wake zone area becomes increasingly smaller as the height to width ratio of a structure increases (Reference 2.3-253). For the NDCT the lesser dimension is the width, which is the base width. Therefore, a conservative method to calculate the outermost boundary of influence exerted by the NDCT is to multiply the maximum width by five.

Using this method, with a maximum width of 140.2 m (460 ft.) at the base of the tower, the downwind wake effect is estimated to extend 701.1 m (2300 ft.) from the base of the NDCT. The NDCT is located approximately 1268 m (4160 ft.) northwest of the new meteorological tower. Thus, the new meteorological tower is at a distance that will not be affected by the wake zone of the NDCT.

~~to be 445 m (1460 ft). Therefore, the NDCT is also expected to influence air flow trajectories at the onsite meteorological tower.~~

~~The dominant wind direction for the 10- and 60-m levels on the meteorological tower, as provided in Figure 2.3-230 and Figure 2.3-243, is southwesterly. Southwest and south-southwest winds, that would allow wake effects from the NDCT towards the meteorological tower, occur approximately 19 percent of the time for both the upper and lower levels. Winds that blow from the Fermi 3 reactor building occur 11 percent and 9 percent of the time at the upper and lower levels, respectively. Considering the distance of the onsite meteorological tower from the Fermi 3 structures and the frequency that wind directions blow from the NDCT and reactor building, wind measurements at the onsite tower are expected to be effected by turbulent flow. Accordingly, the existing meteorological tower would require relocation in conformance with Regulatory Guide 1.23 prior to construction of Fermi 3 structures.~~

Other Estimated Impacts

Operation of large power generation units can have two distinct effects on the local climate, 1) additional generation of particulates (particulate matter and fog) and 2) effects by cooling tower plumes. Air emissions of particulate matter will be minor given the nature of a nuclear facility and its lack of significant gaseous exhausts of effluents to the air. Sources of air emissions for the proposed facility include two standby diesel generators, an auxiliary boiler, a diesel fire pump, and increased automobile traffic. The combustion sources mentioned above will be designed for efficiency and operated with good combustion practices on a limited basis throughout the year (often only for testing). Given the small magnitude of size and infrequent operation, these emissions will only have a minimal impact on the local and regional air quality, and furthermore the local climate. These emissions will be regulated by the State of Michigan, Department of Environmental Quality.

Plumes emitted from cooling towers can also affect the local climate. Fermi 3 will include a NDCT as the main cooling method and two multi-cell MDCTs as the auxiliary cooling method. The predominant wind direction at the Fermi site is southwesterly at the 10- and 60-m levels. This indicates that the cooling tower plumes will most frequently extend over the Fermi site and towards Lake Erie. A more detailed explanation of the effects of the cooling tower plumes on the local meteorology is provided in the following sub-section.

2.3.2.2.1 **Cooling Tower Plumes**

Cooling systems depend on evaporation of water to dissipate heat created from the energy production process. In this cooling process the cooling towers often create visible plumes that can produce effects on the local environment. The visible plumes can produce shadows on surfaces such as trees, vegetation and nearby buildings. Cooling tower plumes can also create or enhance ground level fogging or icing, as well as increase salt deposition. An assessment of cooling tower plumes emitted during the operation of a new power production facility at the Fermi site on the local environment and atmosphere was performed. The investigation was performed using the Electric Power Research Institute's Seasonal/Annual Cooling Tower Impact Prediction Code (SACTI), a model endorsed by Section 5.3.3.1 of NUREG-1555 (Reference 2.3-254). The model used meteorological data from the ~~Fermi~~ onsite tower for the available five-year period of 2003 through 2007. The onsite data contains wind direction, wind speed, dew-point temperature, and dry-bulb temperature measurements at 10- and 60-m heights. Since the meteorological tower does not record atmospheric pressure, station pressure data commensurate with the onsite data, was taken from Detroit Metropolitan Airport. Using the dry-bulb and dew-point temperature from the Fermi site, as well as the station pressure from Detroit Metropolitan Airport, the required wet-bulb temperature and relative humidity values were calculated (Reference 2.3-240). Mean monthly mixing height values calculated in Subsection 2.3.2.1.7 were also used as inputs for the SACTI cooling tower model analysis.

current

meteorological

current onsite

To assess the potential plume impacts, the NDCT was evaluated for Fermi 3. The cooling tower was modeled as if the power generation process was producing the maximum heat load. Tower-specific data used in the SACTI cooling tower model analysis, such as projected cooling tower dimensions, top exit diameter, and total heat rejection rates, are provided in Table 2.3-285. Since the auxiliary Heat Sink (AHS) will use the two multi-cell MDCTs to dissipate heat from the Plant Service Water System mainly during plant shutdown/cool down, the operation of the two multi-cell MDCTs is expected to be minimal. For this reason, the environmental impact associated with the operation of the two multi-cell MDCTs is bounded by the impacts associated with the NDCT. The remainder of this section will provide the potential plume impacts that result from the operation of the NDCT.

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~~Table 2.3-286 displays the average plume lengths by season and direction during NDCT operation. Average plume lengths are longest for the NDCT during winter when average monthly temperatures are coldest (Reference 2.3-201). Table 2.3-287 presents annual plume length frequency for the NDCT. Previously it was stated that the NDCT will be positioned approximately 414 m (1359 ft) southwest from the meteorological tower. It can be reasonably stated that winds that blow from the southwest and south-southwest will allow a plume to travel towards the onsite meteorological tower. Using this method the tables indicate that plumes from the NDCT traveling in the northeast and north-northeast directions reached the onsite meteorological tower 7.66 percent and 7.76 percent, respectively, of the time annually. This evaluation does not account for the height of the plume as it travels from the cooling towers and is likely an overestimate of the number of times a plume reaches the meteorological tower on an annual basis. In addition, plumes from the NDCT are emitted at a height of 182.9 m (600 ft) and after additional plume rise will have negligible effects on the meteorological tower.~~

2.3.2.2.2 Cooling Tower Plume Effects on Ground Level Meteorological Variables

new

As was discussed previously, the plume effects on the onsite meteorological tower are ~~considered~~ negligible. However, cooling tower plumes will influence some of the ground level meteorological variables very near the base of the cooling tower. This section investigates these influences and their impact at the Fermi site.

Wind

There are two effects of the NDCT on the local wind field. During the operation of the cooling tower air is drawn in at the base of the tower. The air is then heated by evaporation as it passes over the heated water located on the fill, collects moisture, and naturally rises. As the air rises it begins to cool and eventually saturates, forming a plume that exits at the top of the cooling tower. This process is continuous and causes the local wind field to converge toward the base of the cooling towers. The effect of airflow toward the cooling tower is localized and will likely remain within the Fermi property boundary. ~~Hyperbolic shaped cooling towers~~

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Table 2.3-286 displays the average plume lengths by season and direction during NDCT operation, as predicted by the SACTI cooling tower model analysis. Average plume lengths are longest for the NDCT during winter when average monthly temperatures are coldest (Reference 2.3-201). Table 2.3-287 presents annual plume length frequency for the NDCT. The data shown in this table does not account for the height of the plume as it travels from the cooling tower and is likely an overestimate of the number of times a plume reaches the ground at any location onsite on an annual basis. In addition, plumes from the NDCT are emitted at a height of 182.9 m (600 ft.) and after additional plume rise will have negligible effects on the new onsite meteorological tower and other locations within the Fermi property boundary.

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Hyperbolic shaped cooling towers also have an effect of affecting the wind measurements downwind of the wind direction to a distance of five times the maximum width at the base of the tower. As was mentioned previously in Subsection 2.3.2.2, turbulent wind flow downwind of the base of the NDCT is expected to extend to a maximum distance of 701.1 m (2300 ft.).

~~also have an effect of lowering the wind speed downwind of the wind direction to a distance of five times the width of the top of the tower. As was mentioned previously in Subsection 2.3.2.2, turbulent wind flow from the cooling towers is expected to affect the onsite meteorological tower. Therefore, the meteorological tower would require relocation in accordance with Regulatory Guide 1.23.~~

Temperature

The plume that is released from the cooling towers is typically warmer than the ambient air and is mostly dissipated into the atmosphere above the tower height. However, some of the heat is transported downward to the ground downwind of the wind direction. Air temperature at the surface, thereby, is expected to be only slightly warmer within a few hundred feet of the tower. Large plumes may also block the heat from the sun and have the effect of cooling the ambient air at the surface during the day and warming it at night. Once again the effect of the plume on the surface ambient temperature is minimal and cannot be measured beyond a few hundred feet from the tower or plume.

Atmospheric Water Vapor

The vapor plumes increase the absolute and relative humidity values immediately above cooling towers, as indicated by the high frequency of visible plume occurrence. At the surface the absolute humidity only increases slightly as some of the moisture from the plume is transported downward downwind from the cooling tower. During colder temperatures the increase of relative humidity near the cooling tower may be greater due to the relatively lower moisture-bearing capacities of cold air. Overall, the ground level humidity increases from the operation of cooling towers is expected to be very small.

Precipitation

As presented by Huff, drizzle and light snow have been observed within a few hundred feet downwind of cooling towers (Reference 2.3-255). The occurrence of such precipitation events is rare and much localized. Huff compared the fluxes of water vapor from NDCT and MDCT cooling towers to those natural water vapor fluxes ingested into cloud bases of showers and thunderstorms. His results indicate that some enhancement of small rain showers might be expected, as tower fluxes are within an order of magnitude of the shower fluxes. Thunderstorms, with their much

2.3.2.3 Local Meteorological Conditions for Design and Operating Bases

Subsection 2.3.2 provides a discussion of the onsite meteorological conditions in comparison to the regional conditions. The conclusion is that nearby meteorological stations such as Detroit Metropolitan Airport experience climatic conditions that are representative of meteorological conditions at the Fermi site. Wind speed and direction conditions that determine the air dispersion of the region are unique at the Fermi site due to the lake and land breezes that form along the Lake Erie shore. For these reasons the onsite meteorological data would be used for design and operating bases of Fermi 3; however, these data may be supplemented with data from Detroit Metropolitan Airport.

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2.3.3 Meteorological Monitoring

The current Fermi onsite meteorological monitoring program has been in place since it was implemented for Fermi 2 pre-operational meteorological assessment beginning in June 1975. Starting in June 1975, the onsite meteorological monitoring program has met the requirements of Regulatory Guide 1.23 (Reference 2.3-262). Since June 1975, some of the meteorological monitoring program components have been upgraded. ~~This section will describe the current state of the onsite meteorological measurement program. The Fermi 2 meteorological monitoring program provides the basis for the Fermi 3 meteorological preapplication monitoring, site preparation and construction monitoring, preoperational monitoring, and operational monitoring. In addition, data from the onsite meteorological tower is used as the sole input for models that describe the atmospheric transport and diffusion characteristics of the site, as provided for in Regulatory Guides 1.111 and 1.21. A description of the model used to analyze the atmospheric transport and diffusion conditions of the site is described in Subsection 5.3.3 of the Environmental Report.~~

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~~2.3.3.1 Onsite Meteorological Measurement Program~~

The purpose of this section is to identify that the onsite meteorological measurements program and other data-collection programs used by Fermi 3 are adequate to: (1) describe local and regional atmospheric transport and diffusion characteristics within 50 mi (80 km) of the plant, (2) ensure environmental protection, and (3) provide an adequate

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Subsection 2.3.3.1 describes the current state of the onsite meteorological measurement program. The Fermi 2 meteorological monitoring program provides the basis for the Fermi 3 preapplication meteorological monitoring program. In addition, data from the onsite meteorological tower is used as the sole input for models that describe the short- and long-term atmospheric transport and diffusion characteristics of the site, as provided for in NRC Regulatory Guides 1.145 and 1.111, respectively. A description of the model used to analyze the short- and long-term atmospheric transport and diffusion conditions of the site is described in Subsections 2.3.4 and 2.3.5.

The NDCT for Fermi 3 will be built in the approximate location of the current onsite meteorological tower. Thus, a new meteorological tower will be erected in the southeast corner of the Fermi site as displayed in Figure 2.1-204. Subsection 2.3.3.2 describes the site preparation and construction, pre-operational, and operational meteorological monitoring program proposed for Fermi 3.

meteorological database for evaluation of the effects of plant operation. This discussion includes an analysis of the following meteorological monitoring system elements:

- The location of the meteorological tower and instrument siting
- Meteorological parameters measured
- Meteorological sensors
- Instrument surveillance
- System accuracy
- Data recording and transmission
- Data acquisition and reduction
- Data validation and screening
- Data display and archiving
- Data recovery rate and annual and joint frequency distribution of data

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2.3.3.1.1 Tower and Instrument Siting

Figures showing the location of the onsite meteorological tower in respect to offsite meteorological stations and surrounding topography are provided in Figure 2.3-201 of Subsection 2.3.1 and Figure 2.3-256 through Figure 2.3-259 of Subsection 2.3.5, respectively. Figure 2.1-204 of Section 2.1 provides the location of the Fermi site structures in relation to the current onsite meteorological tower. The existing onsite meteorological open-latticed tower is located approximately 339.2 m (1113 ft) west-southwest of the proposed Fermi 3 reactor containment building and has a height of 60.0 m (197 ft) above plant grade. This location is within a distance that is less than 10 times the height of the Fermi 3 reactor building, and therefore does not fully meet the siting criteria of Regulatory Guide 1.23. ~~Accordingly, the existing meteorological tower would require relocation for conformance with Regulatory Guide 1.23.~~ The meteorological parameters specified in Regulatory Guide 1.23 are measured by instrumentation mounted at two levels (10-m (33-ft) and 60-m (197-ft)) of the tower. The 10- and 60-m elevations were selected to approximate the heights of release of activity emanating from ground level and the plant's heat dissipation system, respectively. The meteorological sensors are mounted on booms, which are greater than one tower width away from the tower and are oriented normal to the prevailing wind direction. The meteorological sensor types, heights, and

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2.3.3.1 Fermi 3 Preapplication Meteorological Monitoring Program

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Accordingly, a new meteorological tower will be built prior to construction of Fermi 3. Subsection 2.3.3.2.1 describes the location of the new meteorological tower.

The objective for the meteorological monitoring program is to maintain annual data recovery rates of at least 90 percent on an annual basis for all meteorological parameters in order to assess the relative concentrations and doses resulting from accidental or routine releases. Table 2.3-291 provides recovery rates for the meteorological parameters monitored on the onsite meteorological tower. The recovery rates for each parameter, including the joint data recovery of wind speed, wind direction, and ΔT, exceed the 90 percent guidance criteria in accordance with Regulatory Guide 1.23. In addition, the onsite meteorological data are considered adequate to represent onsite meteorological conditions as required by 10 CFR 100.10 and 10 CFR 100.20, as well as to make estimates of atmospheric dispersion for design basis accident and routine releases from the reactor.

Meteorological data are available in five different formats: instantaneous values, 1-minute blocked averages, 15-minute rolling averages, 15-minute blocked averages, and 1-hour blocked averages. Routine data summaries are generated for each day, calendar month, and calendar year and then archived on the IPCS computers. In addition, joint frequency distributions of wind speed and wind direction for each Pasquill stability category are created from the 1-hour blocked averages. The format of the annual onsite meteorological data summaries and joint frequency distribution tables conforms to the recommended format found in Regulatory Guide 1.23.

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~~2.3.3.2 Pre-Operational and Operational Program~~

~~As described in Section 2.3.3 of NUREG-0800, the current meteorological program establishes a baseline for identifying and assessing the environmental impacts during preapplication, site preparation and construction, preoperating, and operating stages of Fermi 3. Therefore, at this point, the current monitoring program will continue and be used as the basis for recording the necessary meteorological observations during the pre-operation/construction phase of Fermi 3, as well as the operation phase of Fermi 3. Should Detroit Edison choose to install a new meteorological monitoring program either during the preoperational or operational phases of Fermi 3, the program will be sited, installed, and operated in accordance with the provisions of Regulatory Guide 1.23.~~

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2.3.3.2 Fermi 3 Site Preparation and Construction, Pre-Operational, and Operational Onsite Meteorological Monitoring Program

As described in Section 2.3.3 of NUREG-0800, the current meteorological program establishes a baseline for identifying and assessing the environmental impacts during preapplication meteorological monitoring. The NDCT for Fermi 3 will be built in the approximate location of the current onsite meteorological tower. A new meteorological tower will be erected in the southeast corner of the Fermi site. The new meteorological tower will be operational for at least one year prior to the decommissioning of the existing onsite meteorological tower. The meteorological data recorded concurrently from the current and new onsite meteorological towers will undergo a detailed analysis to ensure the meteorological parameters measured at the new meteorological tower are representative of the atmospheric conditions at the Fermi site **[COM FSAR-2.3-003]**. Actual and perceived data biases between the current and new meteorological towers will be documented and evaluated. The site preparation and construction, pre-operational, and operational onsite meteorological monitoring program is described in greater detail in the following subsections.

2.3.3.2.1 Tower and Instrument Siting

The location of the new onsite meteorological tower in respect to the current onsite meteorological tower and Fermi 3 site layout is provided in Figure 2.1-204. The new meteorological tower will be a guyed open-latticed tower built to ANSI/TIA/EIA-222-G standards, located approximately 1341.1 m (4400 ft.) south-southeast of the Fermi 3 reactor containment building and will have a height of 60 m (197 ft.). This location of the new meteorological tower is at a distance that is greater than 10 times the height of the Fermi 3 reactor building, and therefore meets the siting criteria of NRC Regulatory Guide 1.23.

Structures near the location of the new meteorological tower include a water tower with a height of 44.2 m (144.9 ft.) and a maximum width of approximately 16.2 m (53.3 ft.) at the equator of the tank head. The NRC Regulatory Guide 1.23 suggests that a 10-building-height distance of separation is typically applied to square and rectangular structures having sharp edges. The tank head of the water tower structure is spherical and has a sloping surface, and thus can be expected to produce a smaller wake zone. 40 CFR 51.100(ii)(3) defines good engineering practices (GEP) stack height as that which ensures that emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures, or nearby terrain features. "Nearby structures" is defined in 40 CFR 51.100(jj)(1) as that distance up to five times the lesser of the height or width dimension of a structure. Thus, for the water tower with a maximum width of 16.2 m (53.3 ft.), the outermost boundary of influence exerted by the water tower is conservatively estimated to be 81 m (265.8 ft.). The water tower is located approximately 210.9 m (692 ft.)

southeast of the new meteorological tower. Thus, the new meteorological tower is at a distance that will not be affected by the wake zone of the water tower.

Natural obstructions that can influence wind measurements near the new meteorological tower include trees that are taller than 5 m (16 ft.). The location of the new meteorological tower is wooded and contains trees that would influence wind measurements if left at their current height. However, prior to installing the new meteorological tower the trees will be trimmed to a height less than 5 m (16 ft.) in height outwards to a distance that satisfies the 10-building-height distance of separation stated in Regulatory Guide 1.23.

NRC Regulatory Guide 1.23 indicates that ΔT should be measured at 10 and 60 m, and if necessary at 10 m and a higher level that is representative of diffusion conditions from release points higher than 85-m (278.9 ft.). The atmospheric release heights above plant grade for Fermi 3 are 52.6 m (172.6 ft.) for the reactor building/fuel building stack, 71.3 m (233.9 ft.) for the turbine building stack, and 18 m (59.1 ft.) for the radwaste building stack. All release heights for Fermi 3 are below 85 m (278.9 ft.); therefore, the new meteorological tower will have meteorological sensors located at 10 m and 60 m elevations to estimate dispersion conditions for ground-level and the plant's heat dissipation system. The meteorological sensors will be mounted on booms, which will be greater than one tower width away from the tower and will be oriented normal to the prevailing wind direction.

The influence of terrain near the base of the new meteorological tower on temperature measurements is expected to be minimal. The area surrounding the new meteorological tower will not be paved or contain temporary land disturbances, such as plowed fields or rock piles. In addition, the tower will be situated in a relatively flat area that will be at a similar elevation as the plant structures. A climate-controlled instrument shelter will be installed on a concrete slab at the base of the tower; however, materials that minimize influence on the measurements will be used to construct the shelter. The new tower will be built close to the shoreline of Lake Erie such that it can measure the dynamic onshore and offshore flow conditions within the thermal internal boundary layer. Fermi 2 and Fermi 3 are located at similar distances to the western shoreline of Lake Erie, such that measurements made at the new meteorological tower will be representative of atmospheric dispersion conditions that could affect gaseous effluent releases.

2.3.3.2.2 Instrumentation

<u>Meteorological Sensors</u>

The instrumentation on the new meteorological tower will consist of the following: wind speed and wind direction sensors at the 10 m and 60 m levels, a 10 m air temperature sensor, a 10 m to 60 m ΔT, and a 10 m dewpoint temperature sensor.. To minimize data loss due to ice storms, external heaters will be installed on the primary wind sensors. The heaters will be thermostatically controlled and of the slip-on/slip-off design for easy attachment. The wind sensor specifications are not affected by these heaters. In addition, a heated tipping bucket rain gauge will be mounted at ground level on a concrete slab at the base of the meteorological tower away from any potential obstructions. A windscreen will be mounted around the precipitation gage to minimize the amount of windblown snow and debris deposited in the gage.

Redundant, secondary sensors at the 10 m and 60 m levels will also be installed on the new meteorological tower for air temperature, vertical wind speed, horizontal wind speed, and wind direction measurements. Table 2.3-288 provides a listing of the meteorological parameters that will be monitored on the new meteorological tower, the sampling height(s), as well as the sensing technique for the primary and secondary systems.

For the new meteorological tower Fermi 3 intends to use meteorological instrumentation that matches the manufacturer and model numbers in use on the current meteorological tower. The accuracies and thresholds for each meteorological sensor located on the current onsite meteorological tower are presented in Table 2.3-289. The accuracies and thresholds for each sensor on the new meteorological tower will be within the values specified in NRC Regulatory Guide 1.23.

Data Recording Equipment

The data recording process planned for the new meteorological monitoring program will mirror the data recording process for the preapplication monitoring as described in Subsection 2.3.3.1. The manufacturer and model numbers for the data recording equipment that is listed in Table 2.3-289 will be used for the new meteorological monitoring program. One exception is that the signal conditioning equipment used for the current meteorological monitoring program is no longer available from the manufacturer. Therefore, the signal conditioning equipment for the new meteorological monitoring program will be replaced with signal conditioning equipment that has accuracies that are equal to or better than the accuracies listed for the current signal conditioning equipment.

Electrical power for the new meteorological monitoring program will continue to be supplied to the primary and secondary systems by independent power supplies. If one supply fails, the other automatically supplies the necessary power for both systems. The new meteorological tower will be built with two precautions to minimize lightning damage to the system. Two of the three legs of the tower will be grounded and the signal cables will be routed through a lightning protection panel. Each signal line will be protected by transient protection diodes specifically designed to stay below the individual line voltage breakdown point.

2.3.3.2.3 Instrument Calibration, Service, and Maintenance

The instrument calibration, service, and maintenance procedures in place for the current meteorological monitoring program will continue for the new meteorological program. Subsection 2.3.3.1.3 provides a description of the instrument calibrations program, while

Subsection 2.3.3.1.4 provides a description of the instrument service and maintenance program. System components that collect, transmit, process, record, and display the meteorological data will be inspected, calibrated, serviced, and maintained such that at least 90% data recovery is achieved for the new meteorological monitoring system.

2.3.3.2.4 Data Reduction, Transmission, Acquisition, and Processing

The method of data reduction, transmission, acquisition, and processing that is described in Subsections 2.3.3.1.5 and 2.3.3.1.6 for the pre-application monitoring program will be used for the site preparation and construction, pre-operational, and operational monitoring programs.

Table 2.3-289 Accuracies and Thresholds for the Fermi Onsite Meteorological Monitoring Program Instruments (Sheet 1 of 2) [EF3 COL 2.0-9-A]

Wind Speed Sensors: All Levels

Sensor:	~~Climet~~ Climatronics Instruments model #WS-011-1. Wind speed transmitter and cup assembly.	
	Distance constant:	5 ft maximum
	Threshold wind:	0.6 mph
	Accuracy:	±0.1% or 0.15 mph, whichever is greater
Electronics:	Analog signal conditioner constructed by EG&G, Albuquerque.	
	Accuracy:	±0.1% full scale
Recorder:	Digital representation of Datel Systems, Inc. model #ADC-E 3-digit (BCD) analog to digital converter.	
	Overall System Accuracy:	±1% or 0.15 mph
Recorder: (Backup)	Esterline Angus Model #EAL1102S dual analog recorder	
	Accuracy:	±0.25% full scale
	Overall System Accuracy:	±1.04% or 0.38 mph, whichever is greater

Wind Direction Sensors: All Levels

Sensor:	~~Climet~~ Climatronics Instruments model #WD-012-30 wind direction transmitter and wind vane assembly.	
	Distance constant:	1 m maximum
	Damping ratio:	0.4 standard
	Threshold:	0.75 mph
	Accuracy:	±3°
Electronics:	Analog signal conditioner constructed by EG&G, Albuquerque.	
	Accuracy:	±0.10% full scale
Recorder:	Digital representation of Datel Systems, Inc. model #ADC-E 3-digit (BCD) analog to digital converter.	
	Accuracy:	±1/2 LSB
Recorder: (Backup)	Esterline Angus model #EAL1102S dual analog recorder.	
	Accuracy:	±0.25% full scale
	Overall System Accuracy:	±3.2°

Attachment 2
NRC3-09-0043

Fermi 3 Emergency Plan Markup

Markup of Fermi 3 Emergency Plan
(Following 1 page)

The attached markup represents Detroit Edison's good faith effort to show how the COLA will be revised in a future COLA submittal. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAI's, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different that as presented herein.

Figure I-3: Fermi 3 Site Layout