STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

APPLICATION OF INDIANA MICHIGAN POWER COMPANY, AN INDIANA CORPORATION, FOR APPROVAL OF 20 MW_{AC} CLEAN ENERGY SOLAR PROJECT; FOR APPROVAL OF RELATED ACCOUNTING AND RATEMAKING INCLUDING: TIMELY RECOVERY OF COSTS INCURRED DURING CONSTRUCTION AND OPERATION OF THE PROJECT THROUGH I&M'S BASIC RATES OR A SOLAR POWER RIDER, APPROVAL OF DEPRECIATION PROPOSAL, AND AUTHORITY TO DEFER COSTS UNTIL SUCH COSTS ARE REFLECTED IN RATES; AND FOR APPROVAL OF SALE OF RENEWABLE ENERGY CREDITS.	)	**CAUSE NO.** 45245

IURC
PETITIONER'S 4
EXHIBIT NO.
6-9-19 UR
DATE REPORTER

SUBMISSION OF DIRECT TESTIMONY OF
JOSEPH G. DeRUNTZ

Applicant, Indiana Michigan Power Company (I&M), by counsel, respectfully submits the direct testimony and attachment of Joseph G. DeRuntz in this Cause.

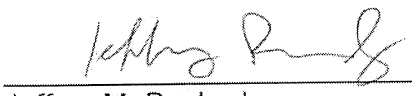
Teresa Morton Nyhart (Atty. No. 14044-49)
Jeffrey M. Peabody (Atty No. 28000-53)
Barnes & Thornburg LLP
11 South Meridian Street
Indianapolis, Indiana 46204
Nyhart Phone: (317) 231-7716
Peabody Phone: (317) 231-6465
Fax: (317) 231-7433
Email: tnyhart@btlaw.com
jpeabody@btlaw.com

Attorneys for Indiana Michigan Power Company

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing was served upon the following via electronic email, hand delivery or First Class, or United States Mail, postage prepaid this 12th day of June, 2019 to:

William I. Fine
Abby R. Gray
Indiana Office of Utility Consumer Counselor
Office of Utility Consumer Counselor
115 West Washington Street
Suite 1500 South
Indianapolis, Indiana 46204
infomgt@oucc.in.gov
wfine@oucc.in.gov
agray@oucc.in.gov



Jeffrey M. Peabody

Teresa Morton Nyhart (No. 14044-49)
Jeffrey M. Peabody (No. 28000-53)
BARNES & THORNBURG LLP
11 South Meridian Street
Indianapolis, Indiana 46204
Nyhart Phone: (317) 231-7716
Peabody Phone: (317) 231-6465

Attorneys for INDIANA MICHIGAN POWER COMPANY

I&M Exhibit: _____

INDIANA MICHIGAN POWER COMPANY

PRE-FILED VERIFIED DIRECT TESTIMONY

OF

JOSEPH G. DERUNTZ

PRE-FILED VERIFIED DIRECT TESTIMONY OF JOSEPH DERUNTZ
ON BEHALF OF
INDIANA MICHIGAN POWER COMPANY

Q. Please state your name and business address.

A. My name is Joseph G. DeRuntz. My business address is 1 Riverside Plaza, Columbus, Ohio 43215.

Q. By whom are you employed and in what capacity?

A. I am employed as Project Director by American Electric Power Service Corporation (AEPSC), a wholly owned subsidiary of American Electric Power Company, Inc. (AEP). AEP is the parent company of Indiana Michigan Power Company (I&M or Company). AEPSC supplies engineering, financing, accounting and similar planning and advisory services to AEP's six regulated electric operating companies, including I&M.

Q. Please briefly describe your educational background and business experience.

A. I earned a Bachelor of Science Degree in Civil Engineering from the University of Missouri-Rolla in 1984 and a Masters of Business Administration degree from the Fisher College of Business at The Ohio State University in 2001. My professional experience includes 34 years working for AEP companies on the design, construction, retrofit, and maintenance of coal, natural gas, nuclear and renewable generating facilities. I have held various positions including design engineer, construction coordinator, project engineer, asset manager and project manager. I am a registered Civil Engineer in Ohio and a PMI certified Project

Management Professional. I assumed my current position as Project Director in 2017.

Q. What are your current responsibilities?

A. As Project Director, I am responsible for the safe and efficient initiation, planning, execution, monitoring, and control of capital projects that serve the needs of the AEP generation fleet. I directly supervise seven generation Project Managers.

Q. Have you previously testified before any regulatory commissions?

A. Yes. I filed rebuttal testimony before the Louisiana Public Service Commission in Docket No. U-33856, and direct testimony before the Kentucky Public Service Commission in Case No. 2015-00152.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to explain the project management and technical aspects of I&M's proposed South Bend Solar Project ("SBSP" or "Project"), for which the Company is seeking this Commission's approval. Specifically, I will discuss: 1) I&M's experience with solar energy projects and technology; 2) a general overview of the Project; 3) the Engineering, Procurement and Construction (EPC) request for proposals (RFP) process and contract; 4) the estimated capital costs for the Project; 5) the Project schedule, including major milestones; and 6) the operation and maintenance of the Project.

Q. Are you sponsoring any attachments in this proceeding?

A. Yes. I am sponsoring the following attachments:

- Attachment JGD-1: Project Cost Estimate (public version).
- Attachment JGD-1C: Project Cost Estimate (confidential version).

Q. Was this attachment that you are sponsoring prepared by you or at your direction?

A. Yes.

SOLAR ENERGY EXPERIENCE

Q. Please summarize the magnitude and nature of AEP's existing renewable generation resources.

A. AEP currently owns 1,325 MW of renewable energy resources, and has Purchased Power Agreements for an additional 3,015 MW. Of the combined 4,340 MW, there are 194 MW of solar, 3,182 MW of wind, and 964 MW of hydro.

Q. Does I&M have experience in solar energy?

A. Yes. I&M owns and operates solar facilities at four different sites, totaling 14.7 megawatts (MW). See Figure JGD-1 for a summary of I&M's solar facilities.

Figure JGD-1 – I&M Solar Facilities

Solar Facility	MW
Watervliet	4.6 MW
Olive	5.0 MW
Deer Creek	2.5 MW
Twin Branch	2.6 MW

These solar sites were approved by the Commission, in Cause No. 44511, and developed by I&M under the Clean Energy Solar Pilot Project (CESPP) so I&M could gain utility scale solar experience.

Q. In what areas has the Company gained utility scale solar facility experience from the CESPP?

A. The Company has gained experience in two primary areas: 1) The Engineering Procurement and Construction (EPC) contracting process; and 2) Commercial and Plant Operations.

Q. How has the Company's experience with utility scale solar enhanced the EPC contracting process?

A. Based upon the experience gained from the Company's CESPP, the EPC contracting process for solar projects has been improved as follows:

- Solar Specification – a streamlined solar-specific technical specification that defines the codes, standards and criteria to engineer and construct the facility was developed;
- Approved Equipment Supplier List – an approved manufacturers list for solar panels and inverters was created, based on a review of the vendors' equipment performance, reliability and financial strength;
- Project and Construction Management – a standardized project and construction management oversight plan specific to solar projects was developed; and
- IT, Communications and Security Infrastructure – refinements to the unmanned site requirements were incorporated into the overall project scope. These requirements include: IT, communication and cyber and physical security.

Q. What actions have been taken in response to the Company's experience gained in commercial and plant operations?

A. Based upon the ongoing operations and maintenance of the CESPP facilities, actions have been taken in the following areas:

- Generation Forecasting and Scheduling: AEPSC evaluated both internal and external forecasting resources, and ultimately chose to develop an internal neural network process that proved to yield the most accurate forecast. AEPSC also developed software systems to facilitate accurate and timely submittal of dispatch schedules and generation output availability notifications. Furthermore, the solar sites are now integrated into the AEP Generation Availability Data (GADs) system and an AEPSC representative participates in the NERC Solar GADs development task force.
- Remote Operations: AEPSC learned that the solar sites needed more power output control and a standardized approach for integration of the sites into both the AEP Generation Dispatch Center and the AEP Monitoring & Diagnostics Center (M&D) Center. Understanding the need, AEPSC developed software which, once deployed, will provide full generation output control over the solar sites. This software will allow AEPSC Generation Dispatch to adjust the generation output, help with reactive power needs, and provide voltage regulation service when needed. In addition, the M&D Center employs specialty software with advanced pattern recognition to monitor the operational health of the solar facilities.

- Site O&M: For the first two years of operation, the preventive and corrective maintenance at the CESPP sites were managed by a third party contractor. Since November 2018, all sites have been operated and maintained using AEP resources. I&M personnel are responsible for both the routine and corrective maintenance, AEPSC staff performs dispatching functions, including the M&D Center which provides operational health and performance oversight. Together, these organizations optimize the operation and maintenance of the solar facilities.

SOUTH BEND SOLAR PROJECT

Q. Please summarize the major features of the South Bend Solar Project.

A. I&M's proposed SBSP is a single site, 20 MW_{AC} name plate capacity solar facility that I&M will build, own, and operate. The facility will consist of First Solar Series 6 thin film solar panels with single axis tracking supports and a total of twenty six (26) inverters and transformers and one (1) generator step-up transformer. This facility will be electrically interconnected to the PJM RTO system via a 34.5 kV tie line to the I&M-owned Capital Avenue Substation, and be required to follow all PJM interconnection and operational rules. The SBSP facility will be designed and constructed by a qualified EPC contractor selected via a competitive Request for Proposal (RFP) process, which I discuss later in my testimony. The interconnection work will be managed by the I&M Distribution Projects organization. Once placed in-service, the Company will manage the ongoing plant activities including commercial dispatch, operation and maintenance.

Q. Where will the South Bend Solar Project be located?

A. The SBSP facility will be located east of Mishawaka, Indiana at the northeast corner of the intersection of Bittersweet Road and Cleveland Road, on an I&M-owned 210 acre site. The 34.5 kV electrical tie line is approximately 4.5 miles long and will terminate at the Capital Avenue Substation near the intersection of SR 331 and McKinley Highway. The facility location is in close proximity to the I&M Twin Branch Generation Office, Interstate 90, and the University of Notre Dame.

Q. What criteria did the Company use to select the Project site location and size?

A. The criteria used in selection of the site was as follows:

- Located in the South Bend area with highly visibility from public roads,
- Sized to accommodate a 20 MW solar facility, and
- Reasonable access to an I&M substation for interconnection.

The Company's Real Estate Asset Management group searched for prospective sites in the vicinity of South Bend and identified one viable location. AEP's Engineering & Electrical Interconnection Planning group analyzed and determined that the Capital Avenue substation, in close proximity to the selected location, was a suitable interconnection point for the facility. An option to purchase was executed and ultimately exercised when the decision to purchase the site was made.

Q. Describe how the SBSP will be integrated into the PJM RTO system?

A. As further discussed below, a PJM Interconnection Request has been submitted for the SBSP site. The request is subject to a PJM multi-step review process wherein PJM will complete a Feasibility Study, a System Impact Study, and a Facility Study for interconnection of the solar generation facility. The PJM studies will evaluate different factors associated with the facility and its subsequent impact on the transmission system. The results of the studies will include required system upgrades, if any, and their associated costs. Once interconnected with PJM, the Project will be an I&M resource and serve the energy and capacity needs of the Company's customers.

Q. What is the current status of the PJM interconnection request?

A. I&M entered the PJM interconnection queue on March 19, 2018. The Feasibility Study was completed in December 2018, and in January 2019 I&M authorized PJM to initiate the System Impact Study. The System Impact Study is expected to be completed by July 2019, the Facility Study in December 2019, and ultimately a signed Interconnection Agreement in February 2020, to support the commercial operation of the facility as further outlined below.

RFP PROCESS FOR EPC CONTRACTOR SELECTION

Q. Please describe the RFP and contractor selection process.

A. The components included in the SBSP EPC RFP bidding process are as follows:

1. RFP Package: The RFP package was developed using an AEPSC standard work practice for contracts of this complexity and magnitude. The package included the above mentioned solar specification, approved equipment

supplier list, commercial terms and conditions, and site and project specific scope of work.

2. Bidders List: A list of qualified bidders was assembled, evaluated, queried for interest in bidding, and approved. Contractor qualification criteria included a review of each prospective contractor's safety program and statistics, financial strength, and relevant solar EPC construction experience. In accordance with Ind. Code § 8-1-8.5-7(4)(B) contractors must also be subject to Indiana unemployment taxes.
3. Bid Evaluation Scorecard: A scorecard with weighted criteria for pricing, performance, safety, technical exceptions, and project execution plan quality was developed and approved. The purpose of the scorecard is to rank the bids, based on the set of pre-selected criteria.
4. Pre-Bid Meeting: A site meeting was held to discuss the RFP and answer any questions concerning the work scope and bidding process. This meeting also provided an opportunity for the bidders to see the site and incorporate any site specific constructability issues into their bid.
5. Bid Evaluation and Scoring: Bids were received and checked for conformance and evaluated for commercial and technical exceptions. Each proposal along with any options submitted, are then scored to determine the relative ranking of the proposals.
6. Contract Negotiations and Award: Comments and/or exceptions to the selected bidder's project scope documents were negotiated and finalized prior to contract award.

Q. What is the status of the EPC RFP process?

A. The EPC RFP Package was issued on November 6, 2018. The Pre-Bid Meeting was held on November 13, 2018 and bids were received December 14, 2018. Three bidders submitted base bids and four options bids which were reviewed for technical and commercial conformance and scored as described above to determine the preferred bidder and option. Negotiations with the selected bidder were completed on May 2, 2019. The contract will be awarded, with notice to proceed contingent on regulatory approval, when AEP approves funding for the project. This funding approval is currently underway and is expected to be finalized by the end of June 2019.

Q. Was the highest scoring bid also the lowest price for the SBSP?

A. Yes, considering the capital cost of the initial bids and the expected annual energy production from the solar facility, out of three bidders the highest scoring bid also yielded the lowest levelized cost of electricity.

Q. How was the expected energy production determined?

A. The expected annual energy production was provided with each RFP bid. AEPSC then engaged Vaisla, a third party consultant, to check the energy production based on the proposed solar panels, inverters and transformers, and the site's geographic location.

SBSP ESTMATED CAPITAL COST

Q. What is the estimated cost of the SBSP?

A. The estimated investment for the Project is $36.77 million. See Attachment JGD-1C Project Cost Estimate for the estimated Project costs, broken down into

the following categories: Land and Project Development, Direct, Owner's, and Indirect.

Q. What is included in the Land and Project Development costs for the SBSP?

A. The Land cost is the actual cost to purchase the site, including the land option, and survey and title work. The Development cost is the cost of internal labor and external services, and PJM interconnection application fees.

Q. What is included in the Direct cost of the SBSP?

A. The Direct cost includes the fixed price EPC contract for construction of the solar facility, and the estimated cost to interconnect the facility to the Capital Avenue substation. The interconnection cost includes the 34.5 kV line, an allowance for modifications at the substation and an allowance for right of way acquisition. The 34.5 kV line and modifications at the substation cost is a Class V estimate developed by AEP Engineering and I&M Distribution Planning, based on construction of a 4.5 mile line as well as bus and breaker work at the substation. The right of way acquisition allowance assumes additions to existing easements.

Q. What is included in the Owner's cost?

A. The Owner's cost includes the internal labor costs to oversee the project including project management, construction inspection, and project controls. Owner's costs also include the cost of communications and IT infrastructure to facilitate monitoring and control during operation, site security, and project contingency.

Q. How much contingency was included in the project cost estimate, and why is the inclusion of contingency prudent and necessary?

A. There is an approximate 3% contingency included in the project cost estimate. With any large capital project, there are risks to be identified and managed. For the SBSP, the risks include potential changes to the Owner's scope of work, unforeseen geotechnical issues that may impact the EPC contract cost, and potential changes associated with routing and constructing the interconnection line to the substation. The AEPSC team will manage the risks associated with the Project and only use contingency dollars if required. If there is a significant scope change that requires the use of contingency, the Project team will request AEPSC management approval and document the final disposition of the contingency allocation. It is standard industry practice to include contingency funds in project estimates, to reflect the costs associated with mitigating potential risks. To determine the contingency, the Project team developed a risk register to identify known risks, the probability of those risks occurring, and their impact to the Project budget. The risk register is a guide in establishing the contingency, and will be monitored throughout the project.

Q. What is included in the Indirect cost?

A. The Indirect cost includes sales and use taxes, internal labor overheads, capital overheads, and allowance for funds used during construction (AFUDC). These costs are estimated based upon established accounting and business unit rates that are applied to underlying cash flow of the estimate.

Q. Is the estimated Project cost reasonable?

A. Yes. Based on the competitive bidding process used, the geographical location requirements, and the solar insolation available, the Project cost is reasonable. The RFP process resulted in a solar facility cost of $1,270/kW. Considering the location, the land cost at $21,500/acre is reasonable and will retain if not increase in value during the life of the Project. The 34.5 kV connection is a distribution-sized line, which reduces the connection costs. The combined solar facility and land cost of $1,838/kW and first year production of 36,787 MW/year yield a levelized cost of energy (LCOE) of $82.38/MWh, for the 30-year life of the Project. The solar facility's expected capacity factor of 20.6% reflects the solar resource profile in northern Indiana. This expected capacity factor is stipulated in the EPC contract, which imposes liquidated damages, if the contractor fails to achieve the contract capacity. Any increase in actual facility capacity from the EPC contract capacity would only further benefit the Company's customers.

PROJECT SCHEDULE

Q. Please provide a schedule for the Project, including major milestones.

A. The EPC contract is expected to be awarded in June 2019, with a notice to proceed contingent on the granting of regulatory approval. The start of construction for the Project is scheduled to occur in May of 2020, with completion on or before December 31, 2020. A high level Project milestone schedule is included below in Figure JGD-2. This schedule allows the SBSP to be constructed at the optimal time of year, and makes the Project eligible for the Federal Section 48 Investment Tax Credit (ITC), at a 26% rate.

Figure JGD-2 – Project Schedule Milestones

Activity	Completion Date
Site Selected	October 2017 (A)
PJM Request for Interconnection	March 2018 (A)
Issue Solar EPC RFP Package	November 2018 (A)
System Impact Study Initiated	January 2019 (A)
Regulatory Filing	June 2019
Solar EPC Contract Award	June 2019
Start Interconnection ROW	June 2019
Regulatory Approval Granted	January 2020
Interconnection Agreement Signed	February 2020
Complete Interconnection ROW	March 2020
Solar EPC Contract Notice to Proceed	April 1, 2020
Construction Start	May 2020
Pile Installation Complete	August 2020
50% of Panels and Inverters Installed	September 2020
100% of Panels and Inverters Installed	October 2020
Complete Interconnection Construction	November 2020
Commercial Operation	December 2020

(A) = Actual

PROJECT OPERATION AND MAINTENANCE

Q. Who will operate and maintain the solar facility?

A. As described previously, I&M will be responsible for the operation and maintenance of the solar facility and will work with AEPSC Generation Dispatch and the M&D Center to optimize the operation of the facility.

Q. What are the estimated O&M costs for the solar facility?

A. The estimated cost to operate and maintain the SBSP is $15/kW-year in 2018 dollars, escalating at 2% per year for the 30-year life of the facility. The 2% escalation is a solar industry standard, and results in an annual O&M expense of $312,000, starting in 2021. The estimate includes all material and labor needed to perform routine preventative and corrective maintenance, including inverter maintenance. This estimate is based on an Electric Power Research Institute (EPRI) report: 2018 Solar Technology Status, Cost and Performance. The estimated annual O&M expense compares favorably with I&M's experience managing the CESPP site, scaled to account for the economies associated with a single 20 MW_{AC} solar facility. In 2018, the cost to operate and maintain four other I&M-owned solar facilities totaling 14.7 MW_{AC} was approximately $18/kW-year.

Q. Please summarize your testimony.

A. The SBSP is a single site, 20 MW_{AC} solar generating facility, being developed using the experience gained from the Company's CESPP. A competitive bidding process was used to solicit and evaluate three qualified bidders. The selected bidder not only had the highest overall score of those submitting bids, they were also the lowest priced bid. Along with the 26% ITC, the Project takes advantage of the latest solar technology and economies of scale to reduce capital and O&M costs. The SBSP will provide competitively priced renewable energy to serve the customers of I&M.

Q. Does this conclude your pre-filed verified direct testimony?

A. Yes, it does.

VERIFICATION

I, Joseph G. DeRuntz, Project Director employed by American Electric Power Service Corporation (AEPSC), affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.

Date: June 12, 2019

Joseph G. DeRuntz

South Bend Solar Project Project Cost Estimate	
Description	**Estimated Cost**
Land Purchase	$5,128,852
PJM Interconnection Application & Studies	$82,000
Pre CI Costs (thru March 2019)	$271,131
Land and Development Costs	**$5,481,983**
EPC Contract Cost	
Right-Of-Way Acquisition	
Interconnection Costs	
Direct Costs	**$27,429,217**
Telecom/Fiber	$200,000
Commerical Operations/IT	$500,000
Revenue Meter	$200,000
Irrigation System Removal	$10,000
O&M Storage Facility	$15,000
Security	$50,000
AEP Services	$280,475
Contingency	$1,200,000
Sales and Use Tax (@ 7.5%)	$96,740
Owner's Costs	**$2,552,215**
Overheads (@ 11.02%)	$543,447
AFUDC (@ 6.26%)	$764,007
Total Indirects	**$1,307,454**
Total Costs	**$36,770,869**