I&M Exhibit: _____

Cause No. 45576

INDIANA MICHIGAN POWER COMPANY

PRE-FILED VERIFIED DIRECT TESTIMONY

OF

QUINTON SHANE LIES

Content

DIRECT TESTIMONY OF QUINTON SHANE LIES
ON BEHALF OF
INDIANA MICHIGAN POWER COMPANY

I. Introduction of Witness

Q1. Please state your name and business address.

My name is Quinton Shane Lies and my business address is One Cook Place, Bridgman, MI 49106.

Q2. By whom are you employed and in what capacity?

I am employed by Indiana Michigan Power Company (I&M or Company) as the Site Vice President at Donald. C. Cook Nuclear Plant (Cook).

Q3. What are your responsibilities as the Site Vice President of Cook?

I am responsible for providing overall management and oversight of Operations, Radiation Protection, Chemistry, Maintenance, Work Control, Outage Management, Environmental, Safety and Human Performance, Regulatory Affairs, Training, Performance Improvement, Security, Projects, Emergency Preparedness, and Material Management.

Q4. Briefly describe your educational background and professional experience.

I received a Bachelor of Science Degree in Nuclear Engineering from Kansas State University in 1994. Additionally, I received a Master's Degree in Mechanical Engineering in 1996, also from Kansas State University. I was previously a licensed engineer in the state of Michigan.

I began my career with I&M in June 1996 as a System Engineer at Cook. In 2000, I joined the Operations Department and obtained my Senior Reactor

Operator's license. After serving in the Cook control rooms as a Unit Supervisor, I held the positions of System Engineering Manager, Operations Manager, Assistant Plant Manager, Engineering Director, Plant Manager, and Engineering Vice President prior to assuming my current position as Site Vice President in 2015. In this position, I report directly to the Chief Nuclear Officer of Cook.

Q5. Have you previously testified before any regulatory commissions?

Yes. I provided testimony before the Indiana Utility Regulatory Commission (Commission) in I&M's two prior base case proceedings, Cause Nos. 44967 and 45235.

I also provided testimony before the Commission related to the Cook Plant's Life Cycle Management (LCM) Project in Cause Nos. 44182 LCM 9 and 44182 LCM 10, and I submitted testimony before the Michigan Public Service Commission in Case No. U-18370 and U-20359.

II. Purpose of Testimony

Q6. What is the purpose of your testimony?

The purpose of my testimony is to:

1) provide an overview of I&M's nuclear generating asset, the Cook Plant,
2) support Cook's operation and maintenance (O&M) expenses during the twelve-month, forward-looking test period ending December 31, 2022 (the Test Year),
3) support the historic nuclear O&M expenses during the Historical Period from January 1, 2020 through December 31, 2020, and

4) support the projected capital expenditures at Cook from January 1, 2021 through December 31, 2022 (the Capital Forecast Period). I also provide an overview of the status of Cook's Life Cycle Management Project.

Q7. Are you sponsoring any attachments?

Yes. I am sponsoring the following attachment:

- Attachment QSL-1: Cook Plant Systems Diagram

Q8. Was the attachment that you sponsor prepared by you or under your direction?

Yes.

Q9. Please summarize your testimony.

The Cook Nuclear power plant provides safe, low-cost, and carbon-free generation to I&M's customers while maintaining the highest standards of regulatory compliance. I&M employs a rigorous process to identify projects that are necessary to meet regulatory requirements and support continued safe and reliable operations. The O&M and capital project costs discussed herein are the result of that process, and are reasonable and necessary for the continued operation of the Cook Nuclear power plant for the benefit of I&M's customers.

III. Cook Nuclear Plant Overview

Q10. Please describe the design of the Cook Plant.

The Cook Plant is a two-unit nuclear power plant located along the eastern shore of Lake Michigan in Bridgman, Michigan. Both units are pressurized water reactors with four-loop Westinghouse nuclear steam supply systems. The

combined nominally-rated net electrical output for both units is 2278 megawatts. A diagram of the Cook Plant Systems is provided as Attachment QSL-1.

Unit 1 received its operating license from the Nuclear Regulatory Commission (NRC) in 1974 and began commercial operation in 1975. Unit 2 received its operating license in 1977 and began commercial operation in 1978. The NRC initially granted 40-year licenses to each unit and granted 20-year license extensions in 2005. Unit 1 is currently licensed to operate until 2034, and Unit 2 until 2037.

Q11. Please describe the Cook Plant's organization.

The Cook Plant is operated by I&M's Nuclear Generation Group (NGG), which consists of approximately 1050 full time I&M employees. Cook also employs approximately 100-200 contract workers on a long-term basis and 600-1000 temporary contract workers for refueling outages. The NGG is organized to ensure that all activities required to operate and maintain the Cook Plant are accomplished in a safe and efficient manner.

Q12. Please describe the Nuclear Regulatory Commission's regulation of the Cook Plant.

The NRC provides specific technical requirements through regulations, regarding the components that must be incorporated into the design of the systems, to ensure the protection of public health and safety. The NRC defines compliance with these regulations during facility operation, in part, by incorporating certain Technical Specifications into the facility Operating License.

These Technical Specifications include Limiting Conditions for Operation (LCO), for use during abnormal, temporary operational circumstances. In order for the Plant to continue operating during this time, the LCO must be continuously met, and the temporary operational circumstance remedied within a specified time. If

an LCO is not met within the specified timeframe, the plant must be shut down until the temporary circumstance is remedied. These NRC regulations drive certain investments at the Cook Plant as described further below.

Q13. Please describe the Cook Plant's overall performance.

Cook's overall performance remains strong. The station continues to receive the highest industry performance rating for nuclear power plants and it also remains in the highest achievable performance category of the NRC's Revised Reactor Oversight Process. These performance levels are being sustained due, in large part, to the type of expenditures supported in this testimony.

Q14. How has this performance been achieved?

Cook is a continuous learning organization, which is steadily strengthened through the application of internal lessons learned, operating experience, benchmarking, and industry best practices to all facets of the plant's design, maintenance, and operation. These practices have directly contributed to the cost-effective, efficient, safe, and reliable operation of the Cook Plant.

Q15. Please describe the planning and management practices of the Cook Plant.

Cook engages in planning and resource allocation through a Nuclear Asset Management (NAM) Process and a strategic Long Range Plan (LRP), which identify critical components and the projects necessary to ensure their reliability.

The NAM Process is used for making operational, resource allocation, and risk management decisions to maximize the asset while maintaining the safety of the plant and meeting regulatory requirements. NAM helps to ensure only necessary capital improvements are made.

The LRP is an element of the NAM Process and is used to identify necessary work years in advance of actual implementation. Plant needs are evaluated and refined by key plant personnel and undergo multiple internal reviews. Cook also works collaboratively with I&M and the American Electric Power Service Corporation (AEPSC)[1] to evaluate the Plant's needs.

As part of the NAM Process and LRP, Cook identifies projects that are necessary to meet regulatory requirements and support safe and reliable operations. Cook applies industry best practices to identify optimum refurbishment and replacement schedules for critical plant components. Projects are prioritized and strategically scheduled in the LRP. The goal is to ensure that components continue to operate consistent with our NRC operating license so as to maintain reliable operations at the Cook Plant.

Q16. Please describe Cook's refueling outages.

Refueling outages occur every 18 months at each unit. The cost of these outages is amortized over a period of 18 months consistent with past practices and concurrent with the timing of the outages. Typically, every year at least one unit is refueled (in either the Spring or Fall), and every third year both units are refueled (one each in the Spring and Fall).

Most recently, Cook has had dual outages in 2019 and will again in 2022. The work scope included in each outage is thoroughly reviewed and managed to minimize duration. Since the Cook Plant provides reliable, low cost generation, Cook seeks to minimize the duration of refueling outages.

[1] AEPSC supplies engineering, financing, accounting, planning, advisory, and other services to the subsidiaries of the AEP system, one of which is I&M.

Q17. Does the Cook Plant benefit customers?

Yes. Nuclear power is an important resource in I&M's energy portfolio. Cook provides safe, low-cost, and carbon-free generation to I&M's customers. Annually, the Cook Plant generates enough electricity to supply approximately 1.5 million homes. Additionally, Cook has a long-standing commitment to nuclear education, community outreach, and non-profit agency support.

IV. Cook Plant Operation and Maintenance Expense

Q18. Please summarize the Cook Plant's O&M expenses.

O&M expenses include base operating expenditures and non-outage equipment reliability expenditures. Included in the base operating expenditures are refueling outage amortizations, which can have a significant impact on O&M expenditures in any given year depending on the refueling outage cycle. The majority of Cook O&M expenses can be described as: 1) labor, including straight time and over time, 2) planned outages, 3) plant maintenance activities, and 4) operating expenses.

Operating and maintaining the Cook Plant involves managing technically complex systems and components. Practically all of Cook's O&M activities are subject to comprehensive regulation and continuous inspection by the NRC.

Q19. What is the Cook Plant doing to maintain a reasonable level of O&M expense?

As described above, Cook is a continuous learning organization and that behavior is evident in our consistent focus on O&M expenses to ensure they are reasonable. For example, we review our head count annually to identify positions that can potentially be eliminated. To date, this has resulted in 140 positions eliminated over the last four years.

Additionally, we take actions to shorten our outages by reviewing planned work, benchmarking our peer nuclear plants and incorporating operating experience and efficiencies. Cook continues to review our preventative maintenance schedules and activities to eliminate unnecessary work. Cook continually looks for ways to keep its O&M expenses low without compromising the safe and reliable operation of its Units.

Q20. How did you develop the forecast Test Year O&M expenses for the Cook Plant?

The NGG is constantly evaluating the future needs of Cook to ensure it continues to operate safely, reliably, efficiently, and in compliance with all regulatory requirements. Cook employees continually assess the condition of plant equipment and plan not only for the modification or replacement of equipment when it reaches the end of its useful life, but also for unforeseen failures.

The NGG and Cook management review the Plant's current and future needs along with historical O&M expenses to develop forecasts, and then reassess those forecasts prior to approval. Forecasts are then refined annually in a collaborative process that involves Cook Plant management, I&M management, and AEPSC management. These reviews ensure that work is performed at a reasonable cost.

Q21. What is the projected Cook O&M expense for the Test Year ending December 31, 2022?

The projected Cook O&M expense for the 12-month Test Year ending December 31, 2022 is $243.1 million.

Q22. Please describe the major areas of O&M expense.

Figure QSL-1 identifies Cook's four major O&M expense categories.

Figure QSL-1. Cook O&M Forecast Period O&M Expense ($000)

Category	2022 O&M Projected Expense
Labor	$129,951
Planned Outages	$48,855
Operating Expenses	$43,219
Plant Maintenance	$21,085
Total	**$243,110**

The largest portion of the Cook O&M expense is the labor category. Labor includes the expenses associated with employing the work force that is necessary to operate the facility and to perform the necessary maintenance to sustain safe and reliable operations.

Planned Outages is the second largest O&M expense category. As required by the fuel cycle, each unit must be shut down every 18 months so that the nuclear fuel can be replenished. While the unit is shutdown, maintenance and testing activities that can only be performed while the unit is offline, are conducted. Outage cost can vary based upon the work scope that is being completed.

A rigorous scoping process is utilized to ensure that the approved work scope is limited to those items that are necessary to ensure safe and reliable operation during the next operating period. Once the work scope has been determined, great effort is taken to optimize the outage schedule so as to minimize the outage duration. Scope control and outage scheduling combined with disciplined execution, ensure that refueling outages are completed in the most cost effective manner.

Operating Expenses represent the third largest O&M category. These expenses are further broken down into the sub-categories of outside services, staff augmentation, materials, and other. Outside services includes a broad collection of services ranging from radioactive waste disposal; trash and water bills; and state and NRC fees. Staff augmentation significantly represents the facilities cleaning, building, and grounds services.

Materials includes costs incurred due to part repair and return, as well as personal protective equipment. Finally, other includes items such as benchmarking and fees. All of these expenses are necessary to ensure the various departments operate in a manner that supports excellent plant operation.

The final O&M category is Plant Maintenance. These expenses include the outside services, materials, and supplies necessary to perform the required preventive and corrective maintenance activities while the units are online so as to support safety and reliability. Various management committees, such as Plant Health Committee and the Preventive Maintenance Oversight Group, provide oversight of the preventive and corrective maintenance activities to ensure that only necessary work is performed.

Also included in this category are expenses that are incurred to maintain compliance with regulatory requirements. Specifically, these activities include accident analysis revisions, regulatory required programs, and the resolution of NRC inspection findings.

Q23. What was the Cook O&M expense for the Historical Period ending December 31, 2020?

The Cook O&M expense for the 12-month Historical Period ending December 31, 2020 was $240.3 million.

Q24. Is the Test Year O&M expense representative of I&M's expected activities and expenses necessary to provide ongoing safe and reliable generation to its customers?

Yes. I&M has a long history of operating the Cook Plant, thereby allowing I&M to understand the ongoing O&M needs. The Test Year O&M expenses represent a reasonable level going forward. These O&M expenses have been scrutinized at the plant, operating company, and corporate levels, and are representative of the necessary Cook Plant O&M expenses.

V. Cook Plant Capital Expenditures

Q25. Please summarize the type of capital expenditures forecast for the Cook Plant during the Capital Forecast Period of January 1, 2021 through the Test Year ending December 31, 2022.

Capital expenditures can be categorized into four types: Life Cycle Management (LCM), Major Projects, Regulatory Compliance and Other. The expenditures during the Capital Forecast Period in each category are described in more detail below.

Q26. What is the amount of capital expenditures forecast for the Cook Plant during the Capital Forecast Period?

Excluding AFUDC, the capital expenditures for the Cook Plant during the Capital Forecast Period are approximately $142 million, as shown on *Figure QSL-2*.

This amount of capital spending is included in the forecast presented by Company witness Heimberger.[2]

Figure QSL-2. Cook Capital Expenditures, excluding AFUDC ($000)

	2021	2022	Total
LCM project	$12,800	$26,375	$39,175
Major projects	$16,400	$15,712	$32,112
Regulatory compliance	$8,336	$2,385	$10,721
Preventative/corrective maint.	$15,155	$19,800	$34,955
Other	$10,036	$15,039	$25,075
Total	$62,727	$79,311	$142,038

Figure QSL-3 shows that I&M forecasts $217 million of capital investment related to Cook to be placed in service (EPIS) in 2021 and 2022.[3]

Figure QSL-3. Cook additions to EPIS in 2021-2022, including AFUDC ($000)

LCM Project	$87,431
Major Projects	$29,899
Regulatory Compliance	$32,328
Preventative/Corrective Maintenance	$22,929
Other	$44,449
Total	$217,036

Q27. How are capital expenditures forecast?

Similar to O&M expenses, proposed capital expenditures undergo an extensive development and refinement process. As discussed above, the LRP identifies necessary expenditures years in advance of implementation and the Cook

[2] Figure NAH-2 of Company witness Heimberger direct testimony shows the AFUDC amounts added to capital expenditures.

[3] Figure NAH-1 of Company witness Heimberger's direct testimony shows how nuclear additions to EPIS are used to forecast total Company Plant in Service activity during the Capital Forecast Period.

Plant's needs are evaluated and refined through multiple levels of review involving Cook Plant personnel, I&M and AEPSC management.

If and when capital investments are made is based on a combination of factors, including whether the investment is needed to fulfill regulatory or safety requirements, the urgency of the need, and economic benefit. All of these factors are evaluated by the management teams responsible for approving capital projects.

Q28. Please describe the Capital Forecast Period expenditures in the LCM Project category.

As noted above, in 2005, the NRC granted 20-year license extensions for both Cook units. The LCM Project is a comprehensive effort that identified and undertook Cook Plant capital investments needed to ensure the units operate through the end of their license extensions.

In Cause No. 44182, the Commission approved the LCM Project and authorized I&M timely recovery of LCM costs through I&M's LCM Rider. I&M forecasts approximately $39 million of capital expenditures on the LCM Project during the Capital Forecast Period. Further, approximately $87 million of LCM capital (including AFUDC) will be placed in service during the Capital Forecast Period.

I&M has and continues to provide the Commission detailed updates on the status of the LCM sub-projects in its LCM Rider adjustment filings (Cause No. 44182 LCM 1 through LCM 10). Cook is on track to complete the overall LCM Project on budget, with all projects installed by the end of 2022.

The LCM Project challenges, cost variances, and schedule changes encountered are within the norm for a project of this magnitude, even considering the additional challenges presented by the COVID-19 pandemic. Continuing to utilize proven project management practices will ensure the

success of this LCM Project. I&M is still confident the LCM Project will be completed at or below the approved project cost estimate of $1.145 billion.

Company witness Auer explains the Company's proposal to sunset the LCM Rider given the anticipated completion of the project.

Q29. Please describe the Capital Forecast Period capital expenditures in the Major Projects category.

Capital Forecast Period expenditures in the Major Projects category are those projects which are valued at $3 million or greater and can be found in the Project Life File in the testimony of Company witness Lucas.

These projects are approved utilizing the previously defined review and approval process through both Cook and I&M management. For the Capital Forecast Period, examples of Major Projects include:

- Cook network redesign and local area network expansions which replace aged and failing infrastructure while creating a wireless infrastructure backbone that will support remote monitoring and predictive technologies allowing Cook to move from time-based preventative maintenance to condition-based preventative maintenance,
- regulatory required aging management examinations that validate the health of the reactor vessel and reactor vessel internal components, and
- replacement of obsolete systems and equipment that has reached the end of its useful life, such as the fire protection alarm system and switchyard transformers.

Q30. Please describe the Capital Forecast Period capital expenditures in the Regulatory Compliance category.

The majority of the Capital Forecast Period expenditures in the Regulatory Compliance category reflect plant modifications required by the NRC in response to the issues experienced at the Fukushima Daiichi nuclear power plant in 2011. Specifically, these modifications include flood barriers and other flood mitigation features as well as a modification that will provide a backup power source to the containment distributed ignition system.

Additional capital expenditures in this category relate to required improvements to the security intrusion detection system (IDS) in which obsolete equipment is being replaced, the cyber security infrastructure which is being upgraded, and the replacement of Cook's warehouse x-ray machines that are needed to meet security regulations.

Q31. Please describe the Capital Forecast Period expenditures in the Preventative/Corrective Maintenance category.

Capital expenditures in the Preventative/Corrective Maintenance category relate to capital expenditures necessary for maintaining and pre-emptively replacing plant components prior to failure.

These expenditures include reactor coolant pump motor preventive maintenance replacements and refurbishments, containment chiller end-of-life replacements building HVAC replacements, Cook's routine capital blanket (NMIB) and preventative and corrective maintenance budgets that are managed by the Plant Health Committee to address unbudgeted equipment and system issues.

Q32. Please describe the Capital Forecast Period expenditures in the Other category.

Capital Forecast Period expenditures in the Other category relate to capital projects that are not captured in the categories discussed above. Such expenditures include:

- building roof replacement projects that are necessary because the roofs are degraded and leaking,
- the auxiliary building passenger elevator replacement because it is at the end of its useful life,
- control room annunciator system software upgrade because the current version will no longer be supported,
- the Unit 2 turbine driven auxiliary feed pump room cooler replacement because it has reached the end of its life, and
- other general plant improvements.

All of these projects are necessary for the facility to operate to the end of its approved license.

Q33. Is the forecast level of capital expenditures reasonable and necessary?

Yes. As the systems, structures, and components reach their end of useful life or become obsolete, they must be replaced. Additionally, capital expenditures must be made to ensure compliance with evolving regulatory requirements.

The level of capital investment to be made during the Capital Forecast Period represents a reasonable level of spending needed to ensure the safe and reliable operation of the Cook Plant which in turn provides low cost, safe, environmentally compliant, reliable electric generation for I&M’s customers.

VI. Dry Cask Storage

Q34. Please describe the breach of contract by the United States Department of Energy (DOE) as it pertains to the Dry Cask Storage Project?

I&M is the "Purchaser" under a Standard Contract with the DOE for the acceptance of spent nuclear fuel (SNF) and high-level radioactive waste (HLW) under the Nuclear Waste Policy Act. *See* 10 CFR 961.11. Under the Standard Contract, DOE was supposed to begin accepting SNF and HLW from Cook "not later than January 31, 1998."

However, the DOE has neither accepted this material from any facility nor issued an acceptance schedule as required. This has resulted in a partial breach of contract. Because the DOE has failed to fulfill its contractual obligation to accept Cook's SNF and HLW, Cook has been required to construct Dry Cask Storage to store this material on site. The purpose of the Dry Cask Storage Project is to provide spent nuclear fuel dry storage capacity at the Cook Plant at an Independent Spent Fuel Storage Installation (ISFSI) pad.

This project consists of loading SNF assemblies into stainless steel canisters which are then transferred into dry concrete casks. To date, Cook Plant has loaded 44 casks with 1,408 fuel assemblies. The next loading campaign is scheduled to occur in 2021.

Q35. Does I&M have a settlement agreement with the DOE as a mechanism for submitting and recovering costs associated with Dry Cask Storage?

Yes. I&M has had a Settlement Agreement (Agreement) with the DOE since October 2011. Claims are submitted on an annual basis according to terms laid out within the Agreement. The Agreement recovers costs incurred through December 31, 2022. As of December 31, 2020 I&M has submitted eleven claims and has recovered $184.5 million from the DOE. This equates to a recovery rate of approximately 97%. Company witness Seger-Lawson discusses I&M's

request for deferral accounting authority related to this Settlement Agreement claims process.

VII. Work and Asset Management System

Q36. Please describe the Cook Plant's work and asset management system.

As mentioned in the testimony of Company Witness Lucas, the corporate IT forecast includes investment in a new Work and Asset Management (WAM) software program. All maintenance activities performed at Cook are tracked and executed using WAM software.

More specifically, it is used to coordinate all aspects of the work control process; including, but not limited to, work package planning, parts purchasing and receipt, field work performance, work package close out, and work invoicing. The WAM software also integrates with other required software programs to support successful and safe completion of work such as the work activity scheduling software, the equipment lock out/tag out software, and the financial software.

Without the WAM software, the maintenance required to sustain safe and reliable operation could not be performed. Although Cook currently uses INDUS Asset Suite WAM software, it is transitioning to Maximo WAM software.

Q37. Is it necessary to transition to a new WAM software at this time?

Yes. Cook has used INDUS Asset Suite for the past fifteen years. In approximately 2012, the Asset Suite software vendor (ABB) notified its users that it would no longer support their current software platform and that they were proceeding with a major platform upgrade.

As such, INDUS Asset Suite is now obsolete and no longer supported. With this notification, AEP completed a comprehensive evaluation of its options for a new WAM software platform including staying with the current vendor and transitioning to a completely new WAM software vendor.

Ultimately, the AEP evaluation and selection process determined that changing the WAM software to Maximo, an IBM product, was the best choice. Maximo is highly scalable, supports a broad range of functionality, and has been successfully deployed and used at several other large US utilities. AEP transitioned other business units to Maximo in 2020 and Cook will complete the transition in 2021.

Q38. Does this conclude your pre-filed verified direct testimony?

Yes.

VERIFICATION

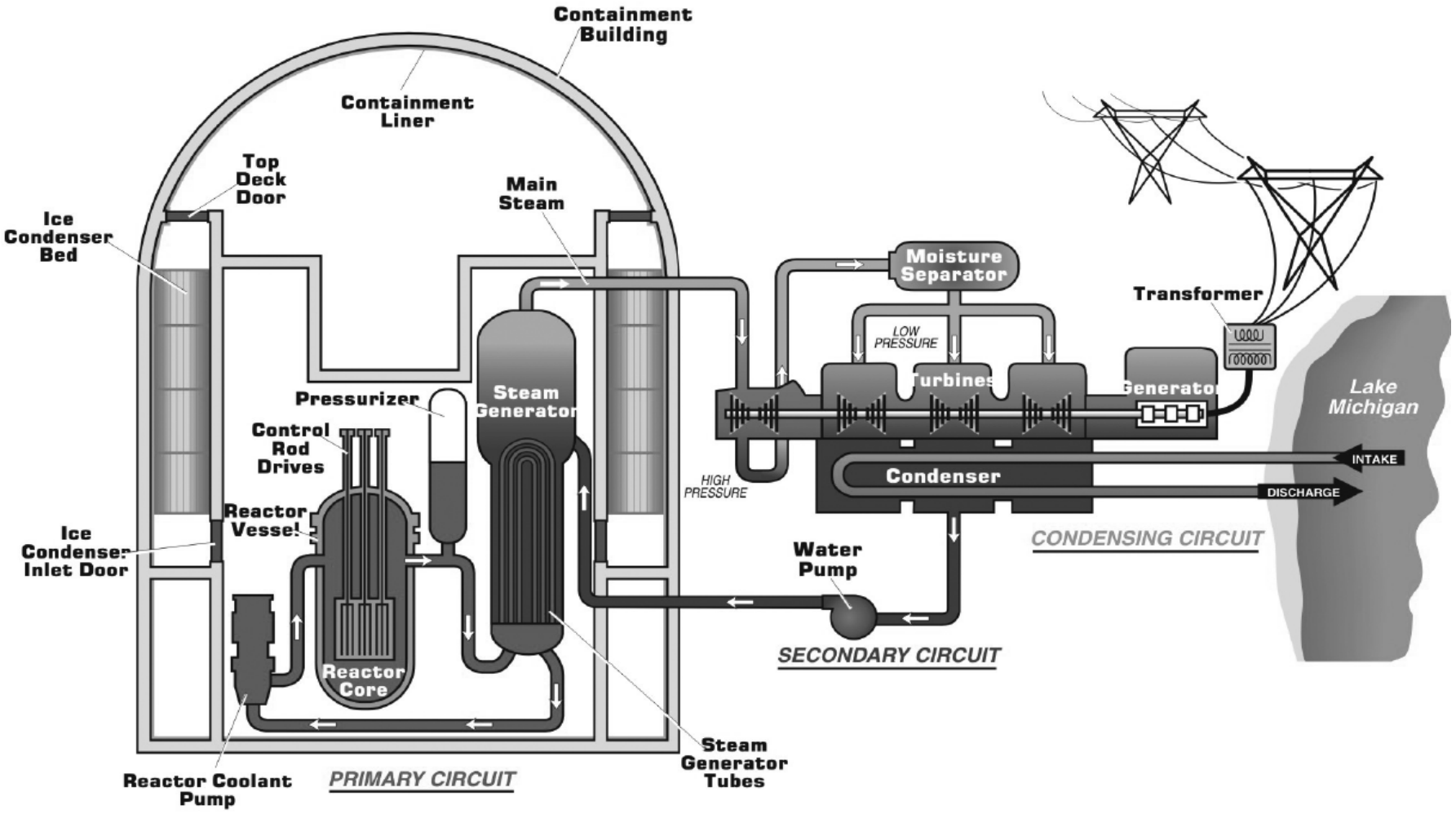
I, Quinton Shane Lies, Title of American Electric Power Service Corporation, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.

Date: 6/28/2021

DocuSigned by:
Quinton Shane Lies
23B07F262EC9440...

Quinton Shane Lies

Cook Nuclear Plant Pressurized Water Reactor



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