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Enhancing Electrical Safety Compliance in Building Permit Applications: A Case Study on Evaluation Practices of a Local Government Unit

Isabelito M. Ripalda[1*], Noel T. Florencondia[2], Michael John M. Villar[3]
[1]*Student, Graduate School, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines*
[2,3]*Professor, Graduate School, Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines*

***Abstract*: Electrical safety in building construction is a critical concern addressed by the Philippine Electrical Code (PEC 2017) and enforced through local government units (LGUs). This study examines the actual evaluation practices of one LGU from 2018 to 2025, focusing on remarks made by a licensed Electrical Engineer Evaluator regarding compliance issues in building and occupancy permit applications. Utilizing document review of anonymized evaluator remarks, the research identifies the most common technical deficiencies, outlines procedural workflows, and proposes actionable reforms. Results reveal persistent documentation errors, non-compliance with design standards, and coordination issues between professionals. Recommendations include standardized checklists, digitized processing, and continuous training. The findings highlight the importance of reliable evaluation systems to ensure electrical safety and public protection.**

***Keywords*: electrical safety, PEC 2017, building permits, LGU compliance, OBO evaluation, permit processing, professional credentials, construction safety.**

1. Introduction

Ensuring the safety of building occupants through proper electrical design and implementation is a foundational responsibility of the Philippine building permit system. The Philippine Electrical Code (PEC 2017) mandates minimum requirements for safe electrical installations, while the National Building Code (P.D. 1096) authorizes LGUs to enforce compliance through their Offices of the Building Official (OBO).

Local Electrical Evaluators perform a crucial function in examining submitted plans and documents to ensure that installations comply with applicable electrical safety standards. Deficiencies in these systems can result in serious hazards, including fires and electric shocks, which lead to fatalities and property loss. This case study investigates actual evaluation practices from one LGU by reviewing permit application data and evaluator remarks from 2018 to 2025.

2. Methodology

This qualitative study used a document review method. The primary source of data was a compilation of technical remarks recorded by a licensed Electrical Evaluator during evaluations of building and occupancy permits between 2018 and 2025. To maintain compliance with the Data Privacy Act of 2012 (RA 10173), all personal and project-identifiable information was excluded.

The analysis focused on identifying recurring issues and procedural patterns. Remarks were categorized by topic, and common deficiencies were grouped based on PEC 2017 articles. This approach allowed the study to maintain technical accuracy while avoiding privacy breaches.

3. Results

A total of 8,647 permit applications were reviewed in this study, encompassing both building and occupancy permit processes. The findings are categorized into four main areas: compliance trends, technical compliance issues, documentation deficiencies, and evaluation workflow.

A. Compliance Trends

- 65% of Applications (5,602) included remarks related to electrical safety compliance, indicating that revisions or additional submissions were required before final approval.
- 35% of Applications (3,045) were found to be compliant upon submission, with no further action needed on the part of the applicant.
A total of 8,647 permit application evaluations were analyzed. Three primary categories emerged: technical compliance issues, documentation deficiencies, and evaluation process insights.

B. Technical Compliance Issues

- *Incomplete or Missing Electrical Design Analysis*: A review of submitted permit applications revealed that many lacked a complete, signed, and sealed Electrical Design Analysis, which is a mandatory requirement under the Philippine Electrical Code (PEC) 2017. According to PEC 2017, Article 1.3.2.1 (F):
"Design analysis shall be included on the drawings or shall be submitted on separate sheets of standard size,

*Corresponding author: isabelitoripalda@gmail.com

and shall show: (1) Branch circuits, sub-feeders, feeders, busways, and service entrance; (2) Types, ratings, and trip settings of overload protective devices; (3) Calculation of voltage drops; (4) Calculation of short circuit current for determining the interrupting capacity of overcurrent protective device for residential, commercial, and industrial establishment; (5) Protection coordination of overcurrent protective devices; (6) Arc-Flash Hazard Analysis to determine the required personal protective equipment (PPE) in other than dwelling place - (see Appendix H for PPE)" (Philippine Electrical Code, 2017, Art. 1.3.2.1).

Footnote No. 1 further clarifies that:

"This analysis is not required for dwelling units but required for service equipment and other electrical equipment not part of the individual dwelling units of residential condominiums and individual detached dwelling units" (Philippine Electrical Code, 2017).

- *Rectify Feeder or Service Load Calculations & Protective Device Sizing*: Several applications required correction of feeder/service load computations. Issues were often related to incorrect total connected load, improper sizing of main feeders, and misaligned protective devices. These must be rectified per PEC 2017 Article 2.10 and 2.30.
- *Incorrect Load Current for Single-Phase Motors and Three-Phase Motors*: A recurring technical mistake was the use of incorrect current ratings for single-phase motors and three-phase motors. Evaluators often instructed applicants to refer to full-load current values prescribed in PEC 2017 tables.
- *Plan-to-Field Discrepancies*: Evaluators flagged differences between submitted plans and actual installations, leading to requests for as-built plans.
- *Discrepancy Between Plan, Layout, and Installed System*: Inconsistencies between submitted plans, single-line diagrams, and actual installed systems were frequent. Examples include mismatched circuit homeruns, missing grounding conductors, and errors in panel schedules.
- Alteration Not Reflected on Plans (e.g., Panel Board, Main Feeder): Changes during construction were often not reflected in the revised electrical plans. Evaluators required updated submissions showing actual installation details.

C. Documentation Deficiencies

- *Missing or Unsigned Certificate of Electrical Safety (CES)*: Many applications were flagged for lacking a CES signed and sealed by the Professional Electrical Engineer. Some CES submissions contained outdated or incorrect project titles, owner names, or data.
- *Absence or Incomplete As-Built Electrical Plan*: Especially in occupancy applications, as-built electrical plans were often not provided or failed to reflect the actual installation.
- *Unclear or Missing Location of Service Entrance on Site Development Plan*: Several evaluations noted the absence of meter center or service entrance information on the site electrical plan.
- *Missing or Invalid Professional Credentials*: Common issues included expired or missing PTR and PRC IDs of Professional Electrical Engineers, Registered Electrical Engineers and Registered Master Electricians. Signatories on electrical documents often did not match those on permit forms or completion certificates.
- *Electrical Permit Form and Completion Certificate Not Properly Filled Out*: Many forms lacked signatures, box numbers (e.g., Box 2 or 2), or had discrepancies between declared professionals. All forms must be completed, signed, and sealed by authorized practitioners.

D. Evaluation Workflow Observations

The electrical evaluation and permitting process, based on updated 2024 procedures of the LGU's Office of the Building Official, follows a defined workflow involving several departments:

1. *Submission of Application and Documents*
   Applicants submit complete technical requirements to the Evaluation and Processing Division (EPD), including signed and sealed electrical plans, design analysis, bill of materials, and permit forms.
2. *Initial Receiving and Validation*
   EPD staff validates the completeness of the documentary and technical requirements. A follow-up stub is issued for reference.
3. *Coordination with Other Agencies (Concurrent Step)*
   Parallel to the review, coordination is done with the Zoning Administrator's Office (for Locational Clearance) and the Bureau of Fire Protection (for Fire Safety Evaluation Clearance).
4. *Technical Review and Electrical Evaluation*
   Electrical Evaluators review the submitted documents for compliance with PEC 2017. Remarks are made for any technical deficiencies or documentation errors. The applicant is notified via SMS, phone, or official correspondence.
5. *Inspection (If Required)*
   For complex projects or if discrepancies are suspected, a site inspection is conducted to verify that the installation aligns with the approved plans.
6. *Consolidation and Final Review*
   The Evaluation and Processing Division Chief reviews all evaluations and inspection findings, then endorses them for processing.
7. *Order of Payment and Payment Processing*
   Once evaluations are cleared, the applicant is issued an Order of Payment. Payment is made at the City Treasurer's Office.
8. *Permit Processing and Issuance*
   After payment confirmation, the final Building or

Occupancy Permit is processed and released. Applicants sign a release log to formally acknowledge receipt of their permits. If all requirements are met.

4. Discussion

The findings of this study underscore recurring challenges in the evaluation of electrical permit applications at the local government level. The high rate of non-compliance observed in 65% of reviewed applications points to systemic gaps in understanding and implementing the standards outlined in the Philippine Electrical Code (PEC) 2017.

A critical pattern emerging from the data is the frequent omission or incorrect preparation of essential technical documents, such as the Electrical Design Analysis and accurate feeder and service load calculations. These deficiencies suggest that some professionals either lack updated knowledge of PEC 2017 or are not fully attentive to compliance requirements. Further, incorrect current ratings for motors reflect technical miscalculations that could compromise installation safety if left uncorrected.

Another major issue is the disconnect between submitted plans and actual site conditions. Discrepancies between single-line diagrams, schedule of loads, and on-site installations signal a lack of coordination between the design and construction teams. This problem is exacerbated when as-built plans are not submitted or updated, making it difficult for Evaluators to verify system integrity.

The evaluation process also highlighted documentation deficiencies. Many submissions lacked valid or updated professional credentials, and permit forms were often incomplete or improperly filled out. Such administrative oversights not only delay permit issuance but may also signal non-compliance with licensing regulations.

From an organizational perspective, the LGU's workflow while generally systematic faces delay due to manual processes and repetitive corrections. These observations point to potential inefficiencies in how permit applications are submitted, tracked, and revised.

To address these challenges, three key interventions are proposed:

- *Standardized Checklists*: These would provide applicants with a clear guide on the necessary documents and technical details, minimizing common oversights.
- *Digitalization of Permit Processing*: Introducing an online submission and tracking system would enhance transparency, improve coordination, and shorten processing times.
- *Capacity Building and Orientation*: Regular training and awareness campaigns for professionals and contractors can promote accurate adherence to updated PEC provisions.

These proposed solutions align with the goal of enhancing safety, improving efficiency, and ensuring that electrical systems in buildings meet legal and technical standards.

5. Conclusion

This case study affirms the pivotal role of Electrical Evaluators within LGUs in upholding public safety through enforcement of the Philippine Electrical Code (PEC 2017). The review of 8,647 permit applications from 2018 to 2025 reveals persistent challenges, including technical non-compliance, documentation lapses, and disjointed plan coordination.

The study's findings emphasize that many of the observed deficiencies are preventable through improved submission practices, better understanding of PEC requirements, and enhanced coordination among stakeholders. As urban development intensifies, the accuracy and integrity of electrical designs become increasingly critical.

Strengthening the local evaluation process requires a multi-pronged approach: implementing standardized application tools, investing in digital infrastructure, and fostering a culture of technical competence among professionals. Doing so will not only improve permit processing efficiency but will also enhance electrical safety compliance and, ultimately, protect lives and property.

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