IJECBE (2026), **4**, **1**, 109–122
Received (30 December 2025) / Revised (21 January 2026)
Accepted (29 April 2026) / Published (30 March 2026)
https://doi.org/10.62146/ijecbe.v4i1.210
https://ijecbe.ui.ac.id
ISSN 3026-5258

International Journal of Electrical, Computer and Biomedical Engineering

RESEARCH ARTICLE

Evaluation Of the Legality and Requirements of Starlink in Indonesia Using a Regulatory Impact Analysis Approach

Ficco Clivano Ikhsan and Gunawan Wibisono*

Department of Electrical Engineering, Faculty of Engineering, Universitas Indonesia, Depok, Indonesia
*Corresponding author. Email: gunawan@eng.ui.ac.id

Abstract

Starlink's penetration in Indonesia creates a paradox between accelerating national connectivity and the integrity of regulatory sovereignty. This study evaluates the issue of regulatory non-compliance arising from the government's negligence in granting Starlink operational permits, decisions that were not based on in-depth studies and did not fully encompass Starlink's technology capabilities, such as Intersatellite Link (ISL) and Direct-to-Cell (D2C). This resulted in a legal vacuum resulting in inconsistent regulations and unmet requirements. Because Starlink is in a position of violation, using the Regulatory Impact Analysis (RIA) framework and the Plus-Minus Implication (PMI) assessment method, the study examines each administrative sanction for Starlink to find the most effective way to address regulatory non-compliance. The evaluation of Starlink's regulatory compliance stems from technical and legal facts, where the research findings indicate legal conflicts when formal operational permits have been fulfilled, such as public evidence and a lack of licensing coverage. Despite examples of entities whose licensing obligations were revoked due to failure to fulfill licensing obligations (e.g., BTEL), based on stakeholder consultation and PMI scores, Option 2 (Temporary Suspension for Compliance Improvement) was selected as the optimal solution with the highest PMI score (+14) followed by Option 1 (Revocation) which has a similar effectiveness rating in encouraging regulatory compliance (+12) and option 3 which has the lowest effectiveness rating with a score of -4. This policy, based on administrative sanctions law, can be considered the most effective in encouraging regulatory compliance, mitigating market disruption and ensuring public data security compared to other options. The study concluded that current regulatory failures stem from a reactive policy approach followed by government negligence and the granting of partial operational permits without covering appropriate technology. For strategic advice and recommendations, the government is encouraged to adopt the principle of anticipatory regulation based on comprehensive impact studies to

ensure legal certainty for any future telecommunications technology innovations.

Keywords: Starlink, Regulatory Impact Analysis, Legal Vacuum, Licensing, Starlink, Anticipatory Regulation

1. Introduction

1.1 Background

The rapid expansion of internet connectivity in Indonesia over the last decade has fundamentally transformed the national socio-economic and communication landscape. With a population exceeding 280 million people distributed across a vast archipelago of 1.905 million km², the nation faces significant challenges in achieving equitable telecommunications infrastructure. This geographic complexity has resulted in a persistent digital divide, particularly within the frontier, outermost, and least developed regions, known as the 3T areas. While national statistics indicate that internet penetration reached 79.5% in early 2024, the remaining 20.5% represents over 50 million individuals who lack connectivity [1].

Indonesia is one of the world's largest archipelagic states, characterized by significant disparities in telecommunications infrastructure deployment [2]. The emergence of Low Earth Orbit (LEO) satellite systems offers new potential to spread internet access to geographically remote and low-coverage areas capable of addressing coverage and latency limitations inherent in terrestrial and geostationary networks [3], [4], [5], [6]. Currently Starlink, operated by SpaceX, is the leading LEO satellite provider and has begun its commercial operation in multiple countries, which includes Indonesia. From the technical standpoint, these LEO satellites offer solutions to problems that traditional geostationary satellites struggle with, such as latency and speed consistency. It also works without relying on terrestrial infrastructure such as fiber optics and base transceiver stations.

Starlink, as an entity with obligations in both aspects of licensing, must comply with both licensing structures for telecommunications service providers and telecommunications network operators [7]. This is based on how Starlink has its own network and is an internet service provider. Both of these facts place Starlink effectively in both classifications. The entry of Starlink, operating as PT Satellite Service Indonesia (PT SSI), represents a strategic shift in addressing these connectivity gaps. By utilizing LEO satellite constellations, PT SSI offers technical performance comparable to 4G/5G networks, providing a reliable instrument to fulfill the constitutional mandates of Indonesia's Article 28F of the 1945 Constitution and Law and No. 36 of 1999 regarding equitable access to information. This technology facilitates the integration of digital public services, distance education, and real-time telemedicine in remote areas, thereby narrowing the digital divide without the constraints of physical geography [7], [8]. However, the integration of such global satellite services into the national framework requires strict adherence to local licensing regulations, specifically concerning the roles of Telecommunications Network and Service Providers.

Despite its technological advantages, evaluations of PT SSI reveal significant noncompliance with Indonesian regulatory requirements. Critical issues include the

absence of a localized physical Network Operation Center (NOC) and Gateway, as operational control remains centralized in the United States rather than being fully managed within Indonesia. Furthermore, while PT SSI holds a Fixed Network License, it lacks the mandatory Mobile Service License required for its potential or emerging D2D capabilities features. Security concerns also persist regarding Lawful Interception capabilities; the inherent encryption of the satellite system currently obstructs legal surveillance by Indonesian authorities. Additionally, PT SSI has yet to fulfill cybersecurity certification mandates from the National Cyber and Crypto Agency (BSSN), which are compulsory for critical telecommunications infrastructure [9].

To maintain national telecommunications sovereignty and ensure a level playing field, the government is obligated to enforce strict sanctions against such regulatory breaches. Historical precedents, such as the license revocation of PT Bakrie Telecom Tbk due to failure to meet financial obligations, underscore the necessity of administrative discipline. Current assessments suggest that suspending PT SSI's operations may be a necessary measure to compel full regulatory compliance. Moving forward, the application of a Regulatory Impact Analysis (RIA) is proposed to test and refine future telecommunications policies. This systematic approach aims to balance the urgent need for technological acceleration in remote areas with the imperative of maintaining national security and legal integrity within the Indonesian digital ecosystem

1.2 Research Objective

The primary objective of this research is to evaluate the legal validity and regulatory compliance of PT Satellite Service Indonesia (PT SSI) within the national jurisdiction to address the critical uncertainties surrounding its operations. By examining the state decision-making process regarding Starlink's non-compliance, this study seeks to identify appropriate regulatory responses to unresolved licensing and technical requirements [10]. The research aims to provide the Indonesian government with a comprehensive review of advanced satellite technology management while establishing a technical foundation for regulators concerning Network Operation Center (NOC) requirements and Direct-to-Device (D2D) classifications. Furthermore, this investigation serves as a vital reference for industry operators to ensure competitive equality and offers the public critical insights into data protection, communication security, and service stability under national law.

1.3 Method

The scope of this investigation is strictly limited to the Indonesian legal framework and the subsequent impact of Starlink on the domestic telecommunications ecosystem, focusing primarily on compliance assessment and identifying viable government solutions rather than policy justification. To achieve an objective and comprehensive evaluation, the study utilizes the Regulatory Impact Analysis (RIA) as a systematic, evidence-based tool to assess whether existing perimeters effectively manage the risks and technical implications posed by next-generation satellite networks. The methodology integrates empirical literature studies with qualitative interviews to strengthen the analytical results. This RIA framework is executed through a sequence of structured

steps including problem formulation, objective setting, the development of alternative options, cost-benefit analysis, stakeholder consultation, and the formulation of implementation strategies to ensure a robust regulatory recommendation.

2. Regulations, Regulatory Impact Analysis (RIA), and Starlink in Indonesia

2.1 Regulation

The Indonesian telecommunications sector is governed by a centralized risk-based approach through the Online Single Submission (OSS RBA) system as mandated by Government Regulation (PP) No. 5 of 2021 [11]. This framework bifurcates licensing into two primary categories: Telecommunications Network Providers and Telecommunications Service Providers. Network providers are legally obligated to construct physical infrastructure such as towers, earth stations, and gateways, while service providers utilize this infrastructure to deliver retail internet and multimedia services to end-users. Key statutory obligations for all operators include the payment of Non-Tax State Revenue (PNBP) such as the Organizing Rights Fee (BHP) at 0.5% of gross revenue and Universal Service Obligation (USO) contributions at 1.25%. Crucially, Article 22 of PP No. 46 of 2021 requires all providers to implement Lawful Interception (LI) capabilities to ensure national security and lawful surveillance by authorities. Failure to meet these financial, technical, or security mandates triggers a tiered administrative sanction process, ranging from written warnings to the ultimate revocation of operating licenses, as evidenced by the historical precedent of PT Bakrie Telecom Tbk [10], [12].

2.2 Starlink

Starlink, operated by PT Satellite Service Indonesia (PT SSI), utilizes a mega-constellation of Low Earth Orbit (LEO) satellites to provide high-speed, low-latency internet with technical performance comparable to terrestrial 4G/5G networks. While this technology significantly reduces the digital divide in Indonesia's 3T regions [13], it presents severe regulatory challenges due to its decentralized and encrypted architecture [8], [14]. By 2025, the Indonesian Ministry of Communication and Digital Affairs (KOMDIGI) has identified several compliance gaps, most notably the lack of a localized Network Operation Center (NOC) and physical gateways under full Indonesian jurisdiction, as primary control remains centralized in the United States. Furthermore, Starlink's emerging development of Direct to Device and Direct to Cell capabilities should be understood as a prospective regulatory risk rather than an established operational practice within Indonesia. These technologies are conceptually distinct from Starlink's current service architecture and would, if deployed, introduce a qualitatively different compliance profile because native connectivity to standard mobile devices would legally fall under mobile telecommunications services and therefore require specific spectrum allocations and mobile service license that PT Starlink Services Indonesia does not currently hold. At present, the more immediate source of regulatory uncertainty lies not in proven D2D or D2C deployment, but in the structural possibility that such capabilities could be activated without a corresponding adjustment to the licensing framework. This prospective mismatch has nevertheless attracted regulatory attention, as reflected in government signaling during mid

2025 that the provision of mobility related services beyond fixed residential use could trigger administrative sanctions. Framed in this manner, D2D and D2C function as forward-looking stressors that expose the limits of existing license classifications, reinforcing the substantive legality problem without asserting unverified operational violations [15], [16], [17], [18].

However, Inter-satellite Links constitute the primary technical mechanism by which Starlink can effectively bypass local gateways and thereby frustrate gateway-centric regulatory assumptions as user terminals in the field remain conventional satellite dishes while traffic may be relayed across the constellation to ground infrastructure beyond Indonesian jurisdiction, which undermines the operational premises of Network Operation Center and lawful interception requirements. Direct-to-device or direct-to-cell connectivity is a distinct technological capability that involves native service to standard mobile handsets and remains emergent; it should be treated as a prospective aggravating factor only where concrete evidence of deployment exists, not as the foundational cause of present non-compliance. Because current audit protocols and license conditions presuppose deterministic gateway routing and localized control points, they are structurally incapable of verifying whether ISL-based routing relocates control or data processing outside national reach, producing a substantive legality gap even when formal permits appear in order. Framing the regulatory problem around ISL rather than conflating it with D2D therefore anchors legal argumentation in the demonstrable, operational architecture that currently defeats enforcement assumptions and strengthens the RIA's focus on measures that can restore verifiable jurisdictional control without relying on speculative service modes.

2.3 Regulatory Impact Analysis

Regulatory Impact Analysis (RIA) serves as a systematic, evidence-based policy tool designed to assess the efficiency and effectiveness of proposed or existing regulations. According to the guidelines established by the National Development Planning Agency (BAPPENAS), the RIA process involves a structured sequence of problem formulation, objective setting, and the rigorous evaluation of cost-benefit ratios for various policy alternatives. In the context of the Starlink controversy, RIA allows the government to objectively weigh the benefits of rapid technological acceleration against the risks to national data sovereignty and industry stability. By incorporating stakeholder consultations and empirical data from international benchmarks like the OECD, RIA helps regulators avoid poor legal drafting and administrative disputes. For Starlink, this analysis provides a foundation for determining whether strict enforcement of current rules or the adaptation of a new regulatory category for NGSO satellites is the most beneficial path for the Indonesian digital ecosystem [19], [20].

3. Starlink's Position in Telecommunications in Indonesia

3.1 Starlink's Position in the Indonesian Telecommunications Framework

Network Operation Center (NOC) and Gateway Control: Although administrative permits exist, there is no public documentation or technical proof that a functioning NOC exists in Indonesia to handle routing, network monitoring, or lawful interception, leading to a status of non-compliance. The company has failed to demonstrate

the operation of its own local gateways, with current backhaul functions appearing to rely on third-party partnerships rather than independent local infrastructure. Regarding Lawful Interception Obligations, PT SSI has not provided a verified interface for legal surveillance as mandated by Indonesian law, posing a risk to national security and law enforcement capabilities. Fiscal and Domestic Content Compliance: There is no public evidence of the required 0.5% BHP and 1.25% USO payments, and the equipment used (user terminals and antennas) lacks the mandatory Domestic Component Level (TKDN) certification for primary radio devices.

The operational authorization granted to Starlink by the Indonesian government establishes formal legality in the administrative sense, yet it simultaneously exposes unresolved issues of substantive legality arising from inconsistencies with other binding legal instruments. Formal legality is satisfied because the license was issued by a competent authority following prescribed procedures; however, substantive compliance requires that operational realities align with the objectives and requirements embedded in sectoral regulations. In this case, the Network Operations Centre obligation appears formally addressed through the presence of a declared NOC, while Starlink's operational architecture relies on inter satellite links and potential direct-to-device functionality transmissions that are not explicitly reflected in the licensed service scope. These modes of operation bypass the technical assumptions underlying NOC based interception obligations as mandated by Government Regulation No. 52 of 2000 Article 22 paragraph 1 letter c, thereby undermining the regulatory purpose of lawful interception despite nominal compliance. A similar substantive gap emerges in spectrum governance: although ISR (Radio Station License) exists for satellite operations, the potential use of direct to consumer or direct to device connectivity introduces functional equivalence with cellular services, which are subject to a different licensing regime. The inability of the regulator to conclusively demonstrate either the use or non-use of cellular spectrum does not eliminate the compliance risk; rather, it reflects a regulatory blind spot created by technological convergence. This condition confirms that Starlink's legality is formally established yet substantively indeterminate, justifying the use of proportional enforcement options within an RIA framework to determine the most effective mechanism for restoring alignment between licensed authority and actual operations.

Substantive legality extends beyond procedural validity and requires that an authorized activity genuinely fulfills the regulatory objectives embedded in the governing legal framework. In technologically complex telecommunications systems, compliance cannot be inferred solely from the existence of a license, as the legal meaning of that license is shaped by the technical assumptions and enforcement mechanisms it presupposes. When an operator's actual system architecture operates outside those assumptions, formal approval loses its regulatory effect even if no explicit rule is violated on paper. In such circumstances, legality becomes indeterminate not because the state lacks authority, but because the law's substantive intent cannot be operationalized or verified. This distinction is critical in satellite-based services with cross border data flows and non-terrestrial routing, where traditional control points such as network localization, interception nodes, and service classification no longer function as intended. Substantive legality therefore serves as a necessary analytical lens to identify

situations in which administrative permission exists without effective legal control, justifying regulatory intervention despite the presence of formal authorization.

The failure of existing audit mechanisms in this case is primarily rooted in their reliance on regulatory checkpoints that presume terrestrial or gateway centric network architectures. Current audits focus on document verification, declared network elements, and compliance with license conditions that are static in nature, while the operational reality of non-geostationary satellite systems is dynamic, software defined, and transnational. As a result, audits are capable of confirming formal submissions such as licensing documents or declared facilities, but are structurally incapable of verifying how traffic is actually routed, where data processing occurs in real time, or whether functional equivalence with other regulated services emerges at the application layer. This limitation does not indicate regulatory negligence, but rather a mismatch between legacy audit design and convergent satellite technologies, which allows formal compliance to persist alongside substantive uncertainty.

3.2 Global Policy Conflicts and International Enforcement

Global responses to Starlink's expansion reflect a broader trend of prioritizing digital sovereignty over technological convenience. Countries like China and Iran have issued outright bans, viewing the satellite mega-constellation as an instrument of foreign influence and a threat to national information control. In contrast, other nations have adopted a "partial acceptance" model driven by strict enforcement of local laws such as:

A) China and Iran: These nations categorize Starlink as a security threat; China has developed military research to counter the constellation, while Iran has criminalized the possession of terminals and filed complaints with the International Telecommunication Union (ITU) [21], [22].
B) Turkey: The Turkish regulator enforces strict geofencing requirements, demanding that Starlink disable services for maritime vessels entering territorial waters unless they are locally registered [23].
C) India: Under the Telecommunications Act of 2023, India demands rigorous security clearances and data localization, ensuring that international gateways are subject to domestic law before services are authorized [24].
D) France and the United States: The French Council of State previously canceled Starlink's frequency licenses for lack of transparency, while the US Department of Justice recently tightened data security programs to prevent foreign exploitation of personal data handled by US-based firms.

3.3 Broad Legal Implications and Socio-Economic Risks

The introduction of Starlink into the Indonesian market creates a "post-violation" scenario where the technology operates despite inconsistent regulatory adherence, necessitating administrative sanctions such as warnings or license revocation to ensure market fairness. Research indicates that while Starlink addresses the connectivity gap in remote (3T) areas, it creates an unequal burden for local ISPs who must adhere to stricter infrastructure commitments and consumer protection standards [25].

- Data Protection and Privacy: There are significant concerns regarding the storage of Indonesian user data outside of national jurisdiction, which may bypass the personal data protection rights of citizens.
- Regulatory Impact Analysis (RIA): The use of the RIA framework is critical to evaluate whether current regulations are sufficient to manage the risks of next-generation satellite technology while seeking objective, evidence-based solutions.
- Administrative Precedents: Following the precedent of PT Bakrie Telecom Tbk (BTEL), the Indonesian government maintains the authority to revoke licenses if financial or technical obligations are consistently ignored, ensuring the stability of the digital ecosystem.

3.4 Methodology explanation

Regulatory Impact Analysis are applied to Starlink non-compliance by defining a clear baseline and then comparing three discrete enforcement options against that baseline. The baseline will describe the status quo of service provision, market effects, and data flows should no enforcement action be taken. Each enforcement option will be specified in operational terms: a written warning that sets corrective requirements and a compliance timeline, a temporary suspension that halts specified services until corrective conditions are met, and revocation that terminates the operator's authorization. For each option the RIA will identify direct and indirect impacts relevant to compliance and public interest. These impacts include the probability of inducing full compliance, administrative and enforcement costs, disruption to consumers and domestic operators, risks to data sovereignty and national security, and potential legal and reputational consequences. Wherever possible impacts will be quantified or monetized using available data and international benchmarks. Where monetization is infeasible the analysis will record directional effects and magnitude bands to preserve transparency in how qualitative judgments influence conclusions.

The researcher's decision framework will combine a systematic cost benefit matrix with qualitative synthesis drawn from plus minus implication analysis and stakeholder interviews. This research employed expert interviews as qualitative corroborative evidence to strengthen the interpretation of regulatory options rather than to assert institutional positions or to generate quantitative scores. Interviewees were selected based on demonstrated professional competence, structural responsibility, or prior operational experience directly relevant to satellite regulation, network control, and telecommunications governance. Regulatory informants provided clarification on administrative enforcement logic and legal interpretation within the Indonesian framework, while industry practitioners and association representatives contributed technical insight into network architecture, auditability, and market implications. These perspectives are cited as expert opinions grounded in professional experience and are not presented as official policy statements of the institutions with which the individuals are affiliated. Public survey inputs are similarly positioned as contextual evidence reflecting user dependence and risk perception, not as determinative policy signals. This approach preserves analytical rigor, avoids misattribution of institutional intent, and ensures that all qualitative inputs function to substantiate, rather than replace, the formal legal and RIA-based assessment.

For each option the RIA will score a set of predefined criteria such as compliance likelihood, proportionality, enforceability, economic disruption, speed of effect, and legal certainty. Scores will be informed by empirical data, published precedents, and interviews with regulators, industry stakeholders and civil society. Sensitivity analysis will test how robust rankings are to changes in key assumptions. The final recommendation will not be a mere numeric winner but a reasoned judgment that integrates the net quantitative outcome, interview evidence, and legal feasibility under Article 80 paragraph 2 of Law No. 30/2014. The recommendation will include a clear implementation pathway specifying triggers for escalation, monitoring metrics to verify compliance, and a review point to reassess proportionality and market effects.

4. Evaluation of Starlink with Regulatory Impact Analysis (RIA)

4.1 RIA Result

The evaluation of administrative sanctions for Starlink's non-compliance yields a clear hierarchy of effectiveness designed to balance national sovereignty with public interest. The research utilizes a directional and non-econometric Plus-Minus Implication (PMI) method to quantify the impact of three primary policy options: license revocation (Option 1), temporary suspension (Option 2), and written warnings (Option 3). The following sections detail the synthesis of the PMI results alongside the qualitative feedback obtained from expert consultants and stakeholders,

1. Quantitative Superiority of Temporary Suspension (Option 2)
   The PMI assessment identifies Option 2, the temporary suspension of operations, as the most effective regulatory instrument with a total aggregate score of +14. This score reflects a balanced outcome where the interests of regulators (+8) and national operators (+8) are prioritized through strict technical enforcement, while the negative impact on society is minimized to a score of -2. Consultants from the regulatory sector, including representatives from the Ministry of Communication and Digital Affairs, validate this choice, stating that while formal administrative permits have been issued, technical compliance—specifically regarding local Network Operation Centers (NOCs) and gateways—remains unproven and under investigation. Unlike a written warning (Option 3), which scored a -4 due to its inability to compel actual technical changes, Option 2 provides a necessary moratorium that allows for a forensic audit of Starlink's architecture without permanently disconnecting the market.

2. Industrial Equilibrium and Stakeholder Consensus
   Stakeholder consultations with national operators, such as representatives from Telkomsat and the Indonesian Satellite Association (ASSI), emphasize that Starlink currently operates under an asymmetrical regulatory burden. Operators report that the current environment creates an uneven level playing field, as domestic firms face higher regulatory costs and stricter infrastructure mandates compared to Starlink's decentralized model. The PMI analysis confirms that both Option 1 (+8 for operators) and Option 2 (+8 for operators) are viewed as "saviors" of domestic investment. However, expert feedback suggests that Option 1 (revocation) is an

ultimum remedium that should only be triggered if technical verification fails during the suspension period. This strategic escalation ensures that the government maintains its role as a technical controller rather than a passive permit issuer.

3. Public Pragmatism versus National Security Risks
   The societal aspect of the PMI analysis reveals a sharp polarization; the public values Starlink for its superior performance and coverage in 3T regions, leading to a negative PMI score for any intervention that halts service. Nevertheless, survey data indicates a significant underlying concern, with 83.3% of respondents acknowledging national security risks associated with foreign-managed satellite services. Public consultants note that while citizens prefer reliability, they lack trust in the data safety of services managed outside Indonesian jurisdiction. Therefore, Option 2 is academically and practically justified because it bridges the gap between the urgent need for connectivity and the mandatory requirement for data sovereignty, ensuring that the technology is fully compliant with Law No. 27 of 2022 regarding Personal Data Protection before full-scale operations resume.

4. Final Academic Recommendation and Implementation Path
   The RIA concludes that Starlink's current operations exist in a "gray zone" of compliance due to the use of Inter-Satellite Link (ISL) and Direct-to-Device (D2D) features that bypass local gateways. Consequently, the research recommends the adoption of an anticipatory regulatory framework through the immediate implementation of Option 2. This policy involves a structured timeline, including a 4 to 10-week technical audit and a monitoring period of up to one year, to verify that Starlink's control systems are under the effective jurisdiction of the Indonesian government. This measured approach is deemed proportional, ensuring that the acceleration of digital transformation does not compromise the legal integrity or security of the national telecommunications ecosystem

4.2 Policy Option

The policy option set is intentionally limited to three enforcement measures because only these actions directly determine the legal and operational continuity of the regulated entity and are therefore decisive in resolving substantive illegality. Although Article 80 paragraph 2 of Law No. 30 of 2014 lists additional administrative measures, not all of them are equally capable of restoring compliance in cases involving structural licensing deficiencies, data jurisdiction problems, and cross border operational arrangements. Administrative fines and coercive measures function mainly as supporting or punitive instruments and do not, on their own, compel correction of core legal defects. This study therefore focuses on written warning, temporary suspension, and license revocation as they represent substantively different regulatory outcomes that fully capture the government's real decision space while maintaining analytical clarity, proportionality, and methodological rigor within the RIA framework.

Using Cost-benefit analysis inside the RIA framework with the main problem of Starlink's Substantive legality. These are the impact analysis of all the policy options created as a potential response the government could apply starting with the maximum

ruling:

1) Option 1: License Revocation of Operations
   - It reinforced state authority and legal certainty yet eliminates service availability and hinders connectivity of remote regions.
2) Option 2: Temporary suspension of operations with mandatory compliance requirementscomparison
   - This option urges the government to focus on pushing Starlink to Comply the necessary permit and it also offers flexibility but with a risk of prolonged non-compliance and regulatory erosion.
3) Option 3: Written warning
   - This option relies on formal notice, binding deadlines, and compliance audits without escalating to suspension. It preserves service continuity but carries the highest risk of ineffective enforcement if the operator treats the warning as symbolic.

4.3 Plus-Minus Implications dan Consultation

Plus-Minus Implication acts as a structured analytical synthesis developed by the researcher to translate heterogeneous regulatory impacts into a comparable and transparent evaluative framework. Rather than functioning as a standalone quantitative model, PMI operates as an integrative layer within the RIA process that consolidates legal analysis, stakeholder interests, and policy trade-offs derived from the core problem of substantive legality. The scoring is constructed from issue-specific aspects identified in the problem formulation stage and applied consistently across regulators, national operators, and the public to capture directional impacts of each policy option. Positive and negative values do not represent absolute utility but indicate whether a given option advances or undermines regulatory objectives, market fairness, data sovereignty, and social welfare relative to the baseline. By aggregating these implications, PMI enables systematic comparison of enforcement options while preserving the qualitative reasoning underlying each score, allowing the final policy recommendation to reflect both evidentiary assessment and informed regulatory judgment rather than mechanical optimization.

The Plus-Minus implication for each stakeholder regarding the 3 options results in the 3^{rd} option being the least desirable outcome while the 1^{st} and 2^{nd} option having a high positive value with the 2^{nd} option having the highest score which concluded in the 2^{nd} option being the most effective and desired action to take.

From a regulator's perspective, it is without doubt that decisive enforcement is necessary to preserve legal integrity. But actions such as License revocation will present more conflict that solutions. While domestic operators are given a competitive distortion of regulatory asymmetry. The expanded connectivity given by Starlink benefits the public, but it comes with the problem of bearing a risk of data security and service reliability. The best choice is to focus on the compliance yet also update the law to adapt with a new technology. This action will temporarily stop the known

issues and if successful, it will also permanently stop the issue of Starlink's problems with its substantive non-compliance with Indonesian regulations.

5. Conclusion

Given that Starlink's current operational posture is identified as substantively inconsistent with regulatory frameworks and a failure to satisfy essential licensing requirements, this research provides an anticipatory review intended to guide the government toward proactive legal resolutions. When assessing the effectiveness of policy responses across all stakeholders, Option 3, which involves a written warning, is regarded as a lenient approach that offers minimal strategic advantages to national regulators or domestic operators. However, this option is preferred by the general public, specifically users in the 3T regions, because it prevents the disruption of vital internet connectivity.

Table 1. Final Result of Plus-Minus Implication

Stakeholder		Option 1	Option 2	Option 3
Sub-Total (8 aspect each)	Regulator Importance Value	+6	+8	-2
	Operator Importance Value	+8	+8	-6
	Public Importance Value	-4	-2	+4
TOTAL SCORE	Policy Aggregate	**+10**	**+14**	**-4**

Option 1, representing the full revocation of licenses, serves as the second highest ranked choice according to the Plus-Minus-Interesting (PMI) assessment. Although revocation constitutes the most severe administrative sanction and is viewed as a favorable decision by regulators and national operators to maintain industrial stability, primary interview data suggests that this path is not currently recommended. The findings indicate that the heavy burden of Indonesia's connectivity requirements necessitates a more balanced approach that does not immediately terminate essential satellite services.

The research consequently identifies Option 2, the temporary suspension of operations, as the most effective policy instrument to pressure Starlink into compliance without moving directly to permanent revocation. A synthesis of the legal, cost-benefit, and PMI analyses confirms that temporary suspension holds the highest effectiveness in encouraging the fulfillment of all regulatory prerequisites. The established hierarchy of effectiveness for these policy interventions ranks temporary suspension as the primary choice, followed by license revocation, and lastly, the issuance of a written warning.

Throughout the stages of the Regulatory Impact Analysis (RIA), it is demonstrated that while Starlink may possess certain operational permits, its utilization of ISL and potential D2D capabilities features makes the technology inconsistent with the specific licenses it has obtained. Consequently, from an academic and research standpoint, a temporary suspension of operations is recommended as a legitimate, proportional, and appropriate policy for adoption by government decision makers. This measure

provides a necessary window for the verification of technical compliance before any further escalatory decisions are implemented.

References

[1] Badan Pusat Statistik Indonesia. *Jumlah Penduduk Pertengahan Tahun - Tabel Statistik*. https://www.bps.go.id/id/statistics-table/2/MTk3NSMy/jumlah-penduduk-pertengahan-tahun--ribu-jiwa-.html. Accessed: Aug. 11, 2025. 2025.

[2] M. Mulyana. *Towards an Inclusive Digital Economy Executive Summary*. http://www.smeru.or.id. Accessed: 2025.

[3] I. del Portillo, B. G. Cameron, and E. F. Crawley. "A Technical Comparison of Three Low Earth Orbit Satellite Constellation Systems to Provide Global Broadband". In: *Acta Astronautica* 159 (June 2019), pp. 123–135. DOI: 10.1016/j.actaastro.2019.03.040.

[4] SpaceX. *Starlink*. https://www.spacex.com/starlink. Accessed: Dec. 24, 2025. 2025.

[5] International Telecommunication Union. *Connecting the World and Beyond*. https://www.itu.int/en/Pages/default.aspx. Accessed: Dec. 24, 2025. 2025.

[6] C. Elfrida, A. Fauzi, and E. Setyowati. "Analysis of Internet Quality Improvement from HFC to FTTH in Housing X". In: *SISTEMASI* 14.5 (Sept. 2025), pp. 2333–2340. DOI: 10.32520/STMSI.V14I5.5222.

[7] Pemerintah Indonesia. *Undang-Undang No. 36 Tahun 1999*. https://peraturan.bpk.go.id/Details/45357/uu-no-36-tahun-1999. Accessed: Dec. 23, 2025. 1999.

[8] *Network Characteristics of LEO Satellite Constellations: A Starlink-Based Measurement from End Users*. https://ar5iv.labs.arxiv.org/html/2212.13697. Accessed: Oct. 11, 2025. 2022.

[9] D. Laniewski et al. "Starlink on the Road: A First Look at Mobile Starlink Performance in Central Europe". In: *TMA 2024 - Proceedings of the 8th Network Traffic Measurement and Analysis Conference*. 2024. DOI: 10.23919/TMA62044.2024.10559110.

[10] Pemerintah Indonesia. *Peraturan Pemerintah No. 5 Tahun 2021*. https://jdih.komdigi.go.id/produk_hukum/view/id/761. Accessed: Jan. 06, 2026. 2021.

[11] Kementerian Kominfo. *Peraturan Menteri Komunikasi dan Informatika No. 5 Tahun 2021*. https://peraturan.bpk.go.id/Details/203070/permenkominfo-no-5-tahun-2021. Accessed: Dec. 23, 2025. 2021.

[12] OECD. *Recommendation of the Council on Regulatory Policy and Governance*. Tech. rep. Nov. 2012. DOI: 10.1787/9789264209022-en.

[13] S. M. Mohd Hassan, M. Roslee, and A. S. Mohd Marzuki. "A Review of Direct-to-Device Satellite Technology in Bridging Connectivity Gaps in Malaysia". In: *International Journal of Advances in Applied Sciences* 14.4 (Dec. 2025), p. 1251. DOI: 10.11591/IJAAS.V14.I4.PP1251-1262.

[14] N. et al. Mohan. "A Multifaceted Look at Starlink Performance". In: *Proceedings of the ACM Web Conference (WWW 2024)*. May 2024, pp. 2723–2734. DOI: 10.1145/3589334.3645328.

[15] *10,000th Starlink: SpaceX Sets New Record*. https://universemagazine.com/en/10000-starlink-satellites-spacex-breaks-record/. Accessed: Oct. 24, 2025. 2025.

[16] R. Richter, V. Ververis, and V. Bajpai. *Breaking Through the Clouds: Performance Insights into Starlink's Latency and Packet Loss*. 2025.

[17] *Starlink Technology*. https://www.starlink.com/us/technology. Accessed: Jun. 14, 2025. 2025.

[18] O. B. Osoro and E. J. Oughton. "A Techno-Economic Framework for Satellite Networks Applied to Low Earth Orbit Constellations". In: *IEEE Access* 9 (2021), pp. 141611–141625. DOI: 10.1109/ACCESS.2021.3119634.

[19] S. Ma et al. "Network Characteristics of LEO Satellite Constellations: A Starlink-Based Measurement from End Users". In: *IEEE INFOCOM*. 2023. DOI: 10.1109/INFOCOM53939.2023.10228912.

[20] *Regulatory Impact Analysis Best Practices in OECD Countries*. http://www.copyright.com. 1997.

[21] *China: Management Regulations for Terminal Device Direct Satellite Service 2025*. https://digitalpolicyalert.org/event/29573-government-adopted-management-regulations-for-terminal-device-direct-satellite-service-2025. Accessed: Nov. 10, 2025. 2025.

[22] Freedom House. *Freedom on the Net 2024: Iran*. https://freedomhouse.org/country/iran/freedom-net/2024. Accessed: Oct. 17, 2025. 2024.

[23] *Starlink Maritime in Turkey: 2025 Guide*. https://iec-telecom.com/en/news/starlink-maritime-turkey-2025/. Accessed: Oct. 23, 2025. 2025.

[24] *Proceedings of the 4th International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU 2019)*. Ghaziabad, India: IEEE, 2019.

[25] P. W. Nudan, P. Widodo, and M. Affifudin. "Navigating the Starlink Era of Personal Data Protection in Indonesia". In: *Formosa Journal of Science and Technology* 3.7 (July 2024), pp. 1447–1458. DOI: 10.55927/FJST.V3I7.10139.