

Perubahan kontrak merupakan fenomena yang umum terjadi pada proyek konstruksi infrastruktur dan dapat memengaruhi durasi pelaksanaan serta nilai kontrak. Pada proyek Gardu Induk dan Saluran Transmisi Tegangan Tinggi, perubahan kontrak dipengaruhi oleh kompleksitas teknis, ketidakpastian kondisi lapangan, kebutuhan integrasi sistem, pembebasan lahan, serta keterlibatan berbagai pemangku kepentingan. Penelitian ini bertujuan menganalisis karakteristik perubahan kontrak dan dampaknya terhadap durasi serta nilai kontrak, mengidentifikasi faktor penyebab utama, serta merumuskan strategi mitigasi pada proyek gardu induk dan saluran transmisi tegangan tinggi.

Penelitian menggunakan pendekatan *mixed methods* yang mengombinasikan analisis kuantitatif dan kualitatif. Tahap kuantitatif dilakukan melalui analisis data sekunder dari 62 proyek GI Ext, GI New dan SUTT. Data yang dianalisis meliputi perubahan durasi dan nilai kontrak. Analisis dilakukan menggunakan statistik deskriptif dan uji nonparametrik Kruskal-Wallis untuk menguji perbedaan antar kategori proyek. Analisis kualitatif dilakukan melalui wawancara semi-terstruktur dengan para ahli dan pemangku kepentingan proyek untuk menggali penyebab, dampak dan strategi mitigasi perubahan kontrak.

Hasil statistik deskriptif menunjukkan rata-rata perubahan durasi kontrak pada GI Ext, GI New, dan SUTT masing-masing sebesar 41,1%, 116,1%, dan 181,1%, sedangkan rata-rata perubahan nilai kontrak masing-masing sebesar 2,6%, 12,4%, dan 30,6%. Hasil uji Kruskal-Wallis menunjukkan terdapat perbedaan signifikan antar kategori proyek, baik pada perubahan durasi kontrak ($p < 0,001$) maupun perubahan nilai kontrak ($p < 0,001$). Nilai *mean rank* tertinggi terdapat pada SUTT, yaitu 41,22 untuk perubahan durasi dan 41,70 untuk perubahan nilai kontrak. Faktor utama penyebab perubahan kontrak meliputi desain dan kualitas perencanaan, kondisi lapangan, koordinasi pemangku kepentingan, kebutuhan *owner* dan *user*, regulasi dan tata kelola, pembebasan lahan dan ROW, serta faktor eksternal. Strategi mitigasi yang dirumuskan mencakup peningkatan kualitas desain, penguatan investigasi lapangan, pelibatan pemangku kepentingan sejak tahap awal, integrasi kebutuhan *owner* dan *user*, kepastian pembebasan lahan, serta penyempurnaan dokumen kontrak, spesifikasi teknis, dan *Bill of Quantity* (BoQ).

Kata kunci: perubahan kontrak, gardu induk, saluran transmisi tegangan tinggi, perubahan durasi, perubahan nilai kontrak, strategi mitigasi.

ABSTRACT

Contract changes are common in infrastructure construction projects and may affect project duration and contract value. In substation and high-voltage transmission line projects, contract changes are influenced by technical complexity, uncertainty in field conditions, system integration requirements, land acquisition, and the involvement of multiple stakeholders. This study aims to analyze the characteristics of contract changes and their impacts on project duration and contract value, identify the main causal factors, and formulate mitigation strategies.

This study used a mixed-methods approach combining quantitative and qualitative analyses. The quantitative stage used secondary data from 62 GI Ext, GI New, and SUTT projects. The analyzed data included changes in contract duration and contract value. Descriptive statistics and the nonparametric Kruskal-Wallis test were used to examine differences among project categories. Qualitative analysis was conducted through semi-structured interviews with experts and project stakeholders to explore the causes, impacts, and mitigation strategies of contract changes.

The descriptive statistical results show that the average changes in contract duration for GI Ext, GI New, and SUTT were 41.1%, 116.1%, and 181.1%, respectively, while the average changes in contract value were 2.6%, 12.4%, and 30.6%, respectively. The Kruskal-Wallis test indicates significant differences among project categories in both contract duration change ($p < 0.001$) and contract value change ($p < 0.001$). The highest mean ranks were found in SUTT, with 41.22 for duration change and 41.70 for contract value change. The main causal factors include design and planning quality, field conditions, stakeholder coordination, owner and user requirements, regulations and governance, land acquisition and ROW, and external factors. The proposed mitigation strategies include improving design quality, strengthening field investigations, involving stakeholders from the early stage, integrating owner and user requirements, ensuring land acquisition readiness, and improving contract documents, technical specifications, and the Bill of Quantity (BoQ).

Keywords: *contract change order, substation, high-voltage transmission line, duration change, contract value change, mitigation strategy.*