



INTISARI

Suatu gedung rumah sakit 5 lantai yang berlokasi pada zona gempa menengah–tinggi perlu di evaluasi kinerja seismiknya untuk memastikan kelayakan strukturnya sebagai bangunan vital. Gedung ini merupakan bangunan eksisting yang dibangun dengan mengacu pada standar lama, yaitu SNI 1726:2002 dan SNI 2847:2002, sehingga kinerjanya perlu ditinjau kembali berdasarkan standar terbaru agar sesuai dengan ketentuan terkini. Penelitian ini bertujuan mengevaluasi kinerja seismik gedung menggunakan standar ASCE 41-17 serta pembaruan SNI 1726:2019 dan SNI 2847:2019.

Evaluasi dilakukan melalui *Tier 1 (Screening)* meliputi *quick check*, *basic configuration checklist*, *immediate occupancy checklist*, serta *nonstructural checklist*, dan *Tier 3 (Systematic Evaluation)* dengan prosedur linier dinamik berupa *Response Spectrum Analysis (RSA)* dan *Linear Time history Analysis (LTHA)*. Target kinerja yang digunakan adalah *Immediate Occupancy (IO)* untuk kondisi gempa BSE-1E (periode ulang 250 tahun) dan *Life Safety (LS)* untuk BSE-2E (periode ulang 1000 tahun).

Hasil analisis menunjukkan bahwa sebagian besar elemen struktural memenuhi syarat SNI 2847:2019, meskipun terdapat beberapa kekurangan pada detail tulangan. Evaluasi *Tier 1* mengindikasikan adanya potensi ketidakberaturan dan kerentanan pada elemen nonstruktural, namun secara umum masih memenuhi kriteria dasar. Analisis *Tier 3* menunjukkan bahwa pada kondisi BSE-1E gedung mencapai level kinerja IO, sedangkan pada BSE-2E terdapat beberapa komponen yang tidak memenuhi *acceptance criteria*, sehingga target LS belum sepenuhnya tercapai. Perbandingan metode LTHA memperlihatkan bahwa *Spectral Matching* menghasilkan respons yang lebih besar dibandingkan *Amplitudo Scaling*, sehingga lebih konservatif untuk evaluasi bangunan penting.

Kata kunci: Evaluasi struktur, Rumah sakit eksisting, Analisis linier respons spektrum, Analisis linier *time history*, Level kinerja



ABSTRACT

A five-story hospital building located in a moderate-to-high seismic zone requires a seismic performance evaluation to ensure its structural adequacy as a vital facility. This building is an existing structure constructed under the old standards, namely SNI 1726:2002 and SNI 2847:2002, and therefore needs to be reassessed using the updated standards to comply with current requirements. This research aims to evaluate the seismic performance of the building using ASCE 41-17 in conjunction with the updated Indonesian codes SNI 1726:2019 and SNI 2847:2019.

The evaluation was conducted through *Tier 1 (Screening)*, including quick check, basic configuration *checklist*, immediate occupancy *checklist*, and nonstructural *checklist*, as well as *Tier 3 (Systematic Evaluation)* using linear dynamic procedures: Response Spectrum Analysis (RSA) and Linear *Time history* Analysis (LTHA). The performance objectives adopted were Immediate Occupancy (IO) for BSE-1E (250-year return period earthquake) and Life Safety (LS) for BSE-2E (1000-year return period earthquake).

The results show that most structural components comply with SNI 2847:2019, although some deficiencies in reinforcement detailing were identified. *Tier 1* evaluation indicated potential irregularities and vulnerabilities in nonstructural components, but overall compliance with the basic requirements was achieved. *Tier 3* analysis demonstrated that under BSE-1E the building achieved the IO performance level, while under BSE-2E several components did not meet the acceptance criteria, meaning the LS objective was not fully attained. Furthermore, the comparison of LTHA methods revealed that Spectral Matching produced greater responses than Amplitude Scaling, making it the more conservative approach for evaluating critical facilities such as hospitals.

Keywords: Structural evaluation, Existing hospital building, Response spectrum analysis, *Time history* analysis, Performance level