

## Rancang bangun sistem peringatan dini dalam rangka kesiapsiagaan nuklir = Design of early warning system for nuclear emergency preparedness

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### Abstrak

Salah satu upaya perlindungan dari potensi bahaya radiasi di lingkungan sebagai dampak dari adanya lepasan radiasi disekitar fasilitas nuklir adalah dengan pemantauan dosis radiasi di lingkungan secara waktu nyata dan terus-menerus. Penelitian ini mengkaji sistem pemantau radiasi di lingkungan yang telah diterapkan saat ini, kemudian mengembangkan sistem tersebut agar lebih berdayaguna dalam rangka kesiapsiagaan nuklir. Pengembangan sistem dilakukan melalui penambahan jaringan sensor nirkabel dan fitur peringatan dini. Jaringan sensor nirkabel JSN yang diaplikasikan kedalam sistem, meliputi JSN berbasis radio frekuensi RF dan general packet radio service GPRS. Faktor koreksi hasil pengukuran JSN GPRS tipe Pancake terhadap peralatan komersial JSN RF untuk pengukuran paparan radiasi lingkungan adalah 0.657, sedangkan faktor koreksi JSN GPRS tipe NaI Tl adalah 0,502. Data yang dikirim oleh perangkat deteksi gamma dikumpulkan di server yang dikelola oleh Pusat Pendayagunaan Informatika dan Kawasan Strategis Nuklir PPIKSN-BATAN. Data yang diterima server disimpan di database xmonitoring, dapat dilihat secara langsung nilai paparan radiasi di lingkungan melalui phpmyadmin. Disain website dapat dikunjungi pada alamat <http://223.25.97.90/radmon-farid/index.php>. Sistem peringatan dini akan dikirimkan ke operator penanggungjawab sistem radmon, apabila parameter pembatas paparan radiasi lingkungan sebesar 0,3 Sv/jam terlampaui. SMS peringatan dini akan dikirimkan kepada operator sistem radmon setelah 15 - 60 detik data pengukuran paparan radiasi lingkungan diterima oleh server.

*One effort to protection from increasing of potentially environmental radiation hazards as impact of radiation discharge around nuclear facilities by environmental radiation monitoring in real time and continuously. This research focus on radiation monitoring sistem, then develop this sistem more efficiently for nuclear preparedness. This system was developed through addition of wireless sensor networks and early warning features. Wireless sensor networks WSN was applied to this system, including WSN based on radio frequency RF and general packet radio service GPRS. The correction factor of WSN GPRS Pancake type measurement results compare to WSN RF commercial equipment for environmental radiation exposure is 0.657, and correction factor for WSN GPRS NaI Tl type is 0.502. Data has been collected on the servers, who manage by Center for Informatics and Nuclear Strategic Zone Utilization BATAN Serpong. The value of doserate data was received of the server will be viewed on the graph of the website, with address [223.25.97.90 radmon farid index.php](http://223.25.97.90/radmon-farid/index.php). This system will be sent to the radmon operator, if the parameters of threshold environmental radiation level was exceeded from 0.3 Sv h. after 15 60 seconds of measurement data of environmental radiation exposure received by the server. SMS early warning will be delivered to the operator this system, after 15 60 seconds environmental radiation exposure measurement was received.*