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HIERARCHICAL NETWORK-BASED SAFETY ASSESSMENT DECISION SUPPORT SYSTEM FOR THERMAL POWER PLANTS

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Abstract. *We present a new approach to design and develop a safety assessment decision support system (SADSS). This approach can improve extension of knowledge and efficiency of logic inference, combining with hierarchical network and the characteristic of the safety assessment process to build knowledge base. Based on investigation on inference engine and the design method of knowledge base, we introduce in detail how to set up SADSS for thermal power plant based on hierarchical network in this paper. According to introducing decision support system to safety assessment of power production process for power plant, it assists appraisers in making decisions and makes the safety assessment process for thermal power plants systematization and automation. The proposed approach is applied successfully to safety assessment, which improves the level of the safety management.*

Keywords: Safety assessment decision support system (SADSS), Logic inference, Knowledge base, Inference engine

1. **Introduction.** The safety assessment in the industrial domain is paid more and more attention in the recent years. Safety assessment has been developed an important approach to ensure the safety and operation of equipment, and increased the diagnosis accuracy of recognizing fault with equipment. However, the producing mechanism of potential safety hazard is becoming more and more complex, influences the reliability and accuracy of result of safety assessment [1]. On the basis of production practice, safety assessment can not depend on artificial and the single program module to guarantee accurately because of the reliability and real-time requirement, and assessment process must cooperate with intelligent system.

Now, information and network technology are attempted to introduce to the area of safety assessment for power plants. Decision support system is this kind of system that combines information technology and decision theories in management science [1-5]. Decision support system based on the Internet technology is a very good solution for safety assessment. The system will help appraisers of power plants to make objective, scientific and speedy decision. However, decision support system made few applications in practice, because safety assessment process for power plants is a systematic project which is too complicated, and involves domain knowledge of many fields, so there is a problem that how combining expert experiences and mathematical model, and transferring expert experiences into the language which computer can identify, and managing these expert knowledge scientific and orderly, and making inference according to these knowledge reasonably [5-9]. Hierarchical network can provide a methodology to simplify the structure of knowledge and reduce the complexity of knowledge expression of thermal power plants; we will construct a special website of safety assessment based on browser/server model