Hierarchical systems are widely deployed to meet highly complex and advanced functional demands in mission-critical industries, such as aerospace, aviation, defense, and manufacturing. Reliability assurance for such hierarchical systems is challenging because of the complex system structures and imbalanced availability of reliability information from components or subsystems at different levels. In this presentation, I will introduce a multi-level information aggregation methodology, which evaluate system-level reliability by systematically and explicitly aggregating reliability information from lower-level of system elements, i.e., components and/or subsystems. A Bayesian inference framework is proposed to implement information aggregation for given multi-level system structure and interaction relationships among system elements. The proposed methodology has been applied in a variety of reliability assurance studies, including statistical reliability modeling and reliability demonstration testing, and its effectiveness is demonstrated through a series of numerical case studies.