

## Human Factors Training Course

### Course Instructor

Dr. Kenneth P. LaSala currently is the Director of KPL Systems, an engineering consulting firm that focuses on reliability, maintainability, systems engineering, human factors, information technology, and process improvement. Until February of 2002, he also was the System Engineering Staff Manager, Systems Acquisition Office, for the National Oceanic and Atmospheric Administration (NOAA). Dr. LaSala has over 33 years of technical and management experience in engineering. He has managed engineering groups and served as a senior technical staff member in systems engineering, reliability and maintainability (R&M), and product assurance for the Air Force, the Navy, the Army, the Defense Mapping Agency, and NOAA. Also, he has served as the U.S. representative to NATO AC/250, Subgroup IX (Reliability and Maintainability). Dr. LaSala received the 1989 Society of Logistics Engineers (SOLE) Field Award for Reliability and Maintainability. He was the President of the IEEE Reliability Society during 1999-2000 and is the chairman of the IEEE Reliability Society Human Interface Technology Committee. He also currently participates in the DoD Human Factors Engineering Technical Advisory Group and the DoD Advisory Group on Electron Devices. He also participates in the SAE G-13 Human Modeling group and the IEC TC 56 U.S. Technical Advisory Group. His past activities include the Society of Automotive Engineers (SAE) G-11 R&M standards working group, the Electronic Industries Association G-41 (Reliability) and G-47 (Systems Engineering) groups, and International Council on Systems Engineering (INCOSE). His publications include several papers on R&M, systems requirements analysis, and other engineering topics. He also is the author of a chapter on human-machine reliability in the McGraw-Hill *Handbook of Reliability Engineering and Management*, a co-author of the IEEE video tutorial on human reliability, and the author of a MIL-HDBK-338 section on the same topic. He has been an instructor in the University of Maryland graduate program in Reliability Engineering. His research interests include techniques for designing human-machine systems and progressive system engineering approaches. He received the B.S. degree in Physics from Rensselaer Polytechnic Institute, the M.S. in Physics from Brown University, and the Ph.D. in Reliability Engineering from the University of Maryland.

### Course Objectives

- Motivate designers to consider the impact of humans early in the development of systems and processes, when the opportunities for improvement are the greatest
- Serve as a bridge or intermediate step between introductory tutorials and short courses on human factors and human reliability and the many excellent but more extensive texts on human factors
- Serve as a highly understandable and readily accessible source of human factors and human reliability information to those who have limited acquaintances with these subjects
- Provide current information on rapidly changing aspects of human-oriented design

This course is unique because it addresses both human factors engineering and human performance reliability in an interactive manner and thereby adds another dimension of significance to considering the human in system and process development.

### Course Contents

#### Course Overview and Learning Objectives

##### The Need to Consider the Human in System Design, Operation, and Support Human Performance

1. Factors that Affect Human Performance
2. Reliable Human Performance
3. Modeling the Human for Reliability Evaluation Purposes

## **Human Reliability Requirements and Activities**

1. Evaluating the Customer Need
2. The Overall Human Function Design Process
3. Elements of a Human Engineering Design Process
4. Interfaces Between the Human Engineering Program and the Reliability and Maintainability Program

## **Human Engineering Analysis**

1. Qualitative and Quantitative Allocation of Functions to Human-Machine Systems and Processes
2. Human Engineering Analysis Methods
3. Task Analysis
4. Operational Sequence Diagrams and Other Flow Methods
5. Workload Analysis
6. Fault Tree Analysis and Similar Techniques
7. Human Engineering Design Guidelines
8. Computer-Aided Design Tools for Human Engineering
9. Human Interface Simulators

## **Metrics**

1. Quantitative Metrics for Human-Machine Systems and Processes
2. Quantitative Analysis Methods

## **Human Engineering Design Guidelines**

1. Displays and Communications
2. Controls and Tools
3. Work Space Design
4. Environment
5. Time

## **Testing Considerations**

## **Standard Data Sources**

## **Special Topics**

1. Information Technology-Based Processes
2. Manufacturing, Assembly, Maintenance, and Testing Processes
3. Remote Handling Equipment
4. Some Notes on Human-Computer Interfaces
5. Evaluation of Technical Manuals

## **New Developments**