Guidelines for the Verification and Validation of Expert System Software and Conventional Software

Bibliography

Manuscript Completed: February 1995
Date Published: March 1995

Prepared by
L. A. Miller, J. E. Hayes, S. M. Mirsky

Science Applications International Corporation
1710 Goodridge Drive
McLean, VA 22102

Prepared for
Division of Systems Technology
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
NRC Job Code L1530

and

Nuclear Power Division
Electric Power Research Institute
3412 Hillview Avenue
Palo Alto, CA 94303
ABSTRACT

This volume contains all of the technical references found in Volumes 1-7 concerning the development of guidelines for the verification and validation of expert systems, knowledge-based systems, other AI systems, object-oriented systems, and conventional systems.


Advisory Committee on Nuclear Safety, ACNS-4, Recommended General Safety Requirements for Nuclear Power Plants, Advisory Committee of the Atomic Energy Control Board of Canada - Secretariat, Ottawa, Canada K1P 5S9, June 1983.


Antoniou, G., and V. Sperschneider, *On the Verification of Modular Logical Knowledge Bases*, Universitat Osnarbruck, Germany.

Archinoff, G.H., R.J. Hohendorf, A. Wassyng, B. Quigley, and M.R. Borsch, *Verification of the Shutdown System Software at the Darlington Nuclear Generating Station*, Presented at The International Conference on Control & Instrumentation in Nuclear Installations, 8-10 May 1990, Glasgow, United Kingdom.


Chee, C., *Comments on Space Station Freedom Program SSEP Software Life-Cycle Management Standards for Flight and Ground Software*, Private Correspondence to Dr. Michael Freeman, June 1990.


Cohen, P.R., *A Survey of the Eighth National Conference on Artificial Intelligence: Pulling Together or Pulling Apart?*, Survey of 150 papers from the Proceedings of the National Conference on Artificial Intelligence (AAAI-90), Department of Computer and Information Science, University of Massachusetts, Amherst, Massachusetts, December 1990.


Glass, B.J., W.K. Erickson, and K.J. Swanson, *TEXSYS: A Large Scale Demonstration of Model-Based Real-Time Control of a Space Station Subsystem*, Information Sciences Division, NASA-Ames Research Center, Moffett Field, California.


21


Knowledge CASE Tool, 1650 Tyson Blvd., Suite 800, McLean, Virginia 22102 (703) 506-0800.


25


26


Murter, J.S., Integrating a Neural Network and Expert Diagnosis into Data Validation, U.S. Army Combat Systems Test Activity, Aberdeen Proving Ground, Aberdeen, Maryland.


Osborne, Dr. R.L., *Online, Artificial Intelligence-Based Turbine Generator Diagnostics*, AI Magazine Vol. 7 No. 4, pp. 97-103, Fall 1986.


Preece, A.D., *The COVER User Manual*, Center for Pattern Recognition and Machine Intelligence (CENPARMI), Concordia University, Montreal, Canada. COVER version 4.1, release 1, Concordia University, Montreal, Canada H3G 1M8, May 1991.


Reuland, W.B., I&C Requirements and Standards Database (ICRS), Electric Power Research Institute, Generic Safety Analysis Program, Nuclear Safety Analysis Center, Palo Alto, California, Electric Power Research Institute, Palo Alto, California.


Rippon, S., Three Computerized Control Rooms, Nuclear News, pp. 60-63, October 1990.


38

Rushby, J., Verification and Validation of AI-Based Systems for Aerospace Applications, Computer Science Laboratory, SRI International, Menlo Park, California 94025.


TVA-TR81-01, *BWR Transient Analysis Model Utilizing the RETRAN Program*, Tennessee Valley Authority, December 31, 1981.


44


Wells, S.A, *The VIVA Method: A Life-Cycle Independent Approach to KBS Validation*, The VIVA Project, AIE Department, Lloyd's Project, Croydon, United Kingdom.


Wisconsin Public Service Corporation, *Reload Safety Evaluation Methods for Application to Kewaunee*.


Yen, J. and J. Lee, *Enhancing Verification and Validation of Knowledge-based Systems Using a Formal Specification Method*, Department of Computer Science, Texas A&M University, College Station, Texas.


**BIBLIOGRAPHIC DATA SHEET**

**2. TITLE AND SUBTITLE**

Guidelines for the Verification and Validation of Expert System Software and Conventional Software

**Bibliography**

**5. AUTHOR(S)**

L.A. Miller, J.E. Hayes, S.M. Mirsky

**9. SPONSORING ORGANIZATION — NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)**

Science Applications International Corporation  
1710 Goodridge Drive  
McLean, VA 22102

**Division of Systems Technology  
Nuclear Power Division  
Office of Nuclear Regulatory Research  
Electric Power Research Institute  
U.S. Nuclear Regulatory Commission  
3412 Hillview Avenue  
Palo Alto, CA 94303**

**11. ABSTRACT (200 words or less)**

This volume contains all of the technical references found in Volumes 1–7 concerning the development of guidelines for the verification and validation of expert systems, knowledge-based systems, other AI systems, object-oriented systems, and conventional systems.

**12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)**

validation, verification, V&V expert systems, knowledge base, guidelines, scenarios, software quality assurance

**13. AVAILABILITY STATEMENT**

Unlimited

**14. SECURITY CLASSIFICATION**

Unclassified

**15. NUMBER OF PAGES**

16. PRICE
Federal Recycling Program