

# Process Contracting Limited

*Human Factors Consultancy*

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## **Brian SHERWOOD JONES**

Human Factors and System Engineering Consultant

### **Personal Details**

Date & Place of Birth : 29 April 1950, Liverpool

**Speciality** Human Factors

### **Education**

B.Sc. Experimental Psychology 2i Hons (Sussex) 1972

M.Sc. Industrial Psychology (Hull) 1973

Thesis: "Study of a TV Glassware Inspection System"

Honorary Professor, Digital Design Studio, Glasgow School of Art

### **Memberships**

Fellow of the Ergonomics Society (F.Erg.S).

Designated Practitioner on the Professional Register.

Design Research Society

INCOSE

BCS-HCI Specialist Group

Safety Critical Systems Club

[Clients have included Lloyd's Register of Shipping, Glasgow School of Art, companies within BAE Systems, Thales, Synergy, and Gregory Harland Ltd. Brian is a member of the Subject Matter Expert panel for the Human Systems Information Analysis Center and is an associate of Synergy Consultants and Hi-Q Systems.]

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## Experience

Brian has over thirty years experience in all of the Human Factors aspects of complex systems. His interest has been in providing usability assurance, i.e. assurance of safe and effective operation from the early stages of a system through to operational use. This is of particular relevance when developing complex systems for use by reduced numbers of staff, or where there is a change in the context of use. He has contributed to the work of the Human Centred Process Improvement Group (HCPiG), an informal network aimed at promoting best practice in user-centred design. He is the co-ordinator for the Maritime Ergonomics Special Interest Group for the Ergonomics Society, and is involved in reviving the Scottish local group for INCOSE - INCOSE ECOSSE. He is contributing to the promotion of a common approach to human factors aspects of safety across different application domains, whilst working in the maritime sector.

Assignments include the following.

### 1999 to date **Process Contracting Limited**

#### Glasgow School of Art

Contributing to research on virtual shipbuilding and the use of immersive environments for design review.

Taught 'communicating complexity' to product design students.

Oversaw research into 3D presentation of Command and Control information, use of HUD for collision avoidance in cars.

#### Lloyd's Register

Assistance with the development of best practice in managing human element issues, with supporting assessment tools, aids to improvement, and training material.

Support to the *MTO-Sea* project at Kalmar Maritime Academy, aimed at training seafarers to 'make safety' and contribute feedback on design, and to take that feedback to industry stakeholders. Drafted INF paper to IMO on the project.

Presentation to IMO STW on Risk Based Training Needs Analysis (Jan. 2007).

Developing ship design guidance for stevedore safety on container ships.

Collating research and practice on slips, trips and falls in the maritime sector.

Promoting the application of Human Centred Design standards to Naval Human Factors Integration (HFI).

Contributing to consideration of the Human Element in IMO Goal-Based Regulations.

Developing methods for assessing alarm system design and management. Contributing to the specification of alarm system design. Presentation on alarms to SMM Hamburg Sept. 2006.

Developing a new systemic approach to analysing marine incidents with the aim of learning from experience.

Considering ways of providing organisational safety assurance that do not involve an excessive paper trail.

Contributed to the development of a European response to SOLAS Regulation V/15 "Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures" introducing the

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concept of an operability case. Involved in the industry response to this Regulation (IMO, IACS etc.).

Contributed to course run by Lloyd's Register for MOD: 'International Maritime Legislation – An Introduction'.

UK representative on ISO TC8/SC5 updating ISO 8468 on ships' bridge layout.

Contributed to the RMCS course "HFI for Defence Acquisition" (May 2002).

Contributing to the strategy for the Human Element in Lloyd's Register of Shipping.

Contributed to the ADVANCES thematic network on Quality in Shipping.

Contributed to a project to develop the means of assessing the extent to which an organisation carries out user centred design. This has included:

- Contributed to the development of 'The Human Element – Best Practice for Ship Operators', together with material for auditor training and competence assessment, cost-benefit analysis, assessment procedures, marketing material.
- Co-editing a process model, ISO PAS 18152 'A Specification for the process assessment of human-system issues'. This is a profile compliant with the updated issue of ISO 15504, and has links to ISO 15288 and the update to ISO 12207.
- Contributed to the discussion to harmonise work on AP 233 and ISO 15288 as regards possible XML schema.
- Developing web-based process assessment tools for the rapid assessment of an organisation's capability to conduct user-centred design. Contributing to international collaboration on quick assessment tools.
- Developing a framework for assessor competence, which now forms part of the international debate on competence in user-centred design.
- Investigating a possible repository for assessment data with the aim of establishing benchmarks.

## BAE Systems

Working for the Astute Design Authority on manning and safety. Overseeing the HF aspects of the ASTUTE Platform Management Systems for the Design Authority. Led the Human Factors aspects of the ASTUTE platform and platform system design for the PCO HF Manager, and deputising in his absence. This included:

- Developing the management of the operability process, including defining surveillance metrics, running Operability Working Group meetings, developing plans, overseeing progress and risk, progressing operability problems.
- Production of the MMI/HCI Style Guide and the Environmental Specification for ASTUTE and overseeing their implementation.
- Contributing to the development of the Astute manning solution, including propulsion watchkeeping, onboard IT, ship control manning, crew build up.
- Contributing to the General Arrangement and traffic flow of the ASTUTE Class submarine design, reviewing the design, escalating and managing areas of concern across the platform.
- Overseeing platform aspects of C&I. Contributing to the Through Life Information Management.

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- Contributing to the project Human Reliability Analysis
- Support to Human Factors aspects of Health and Safety.

(This work was awarded a BAe Innovation award in 2002).

Contributed to a study into the Human Computer Interface for future warship Platform Management Systems, identifying the factors that affect information usage.

## Gregory Harland

Contributed to a study on future warship complementing, examining the use of manning data in Smart Procurement.

## Synergy

Developed HMI guidelines for a major warship project.

Reviewed ergonomic aspects of a nuclear safety case.

## Thales

Member of the expert panel for the Thales CVF team.

## HCPiG

Promotion of user centred design as a measure of Best Value Performance in public sector service provision. Organised a panel session at ScotSoft 2003 on 21<sup>st</sup> Century Government, A Citizen-centred approach. Contributed to BCS parliamentary briefing for debate on e-government; question based on briefing asked at Westminster Hall debate 13 Oct 2005. Contributed to BCS briefing to Lord Cole's review of HMRC.

## **1984 - 1999 YARD Consultancy, now part of BAE Systems**

Developed a model, assessment scheme and implementation strategy for Human Factors Integration Capability Maturity Modelling - an objective and structured way of

- Assessing the extent to which user aspects are addressed in system development and procurement, and
- Conducting Process Improvement.

Developed a concept for the user aspects of future warship Platform Management Systems and a concept for smart information management and presentation.

Led BAe Human Factors support to the ASTUTE project.

Led a case study into the Human Factors aspects of Concurrent Operational Effectiveness and Investment Appraisal (COEIA), examining manning automation trade-offs for UHF communications in the Type 23 Frigate. Contributed to the Guidance Document for Human Factors Support to COEIA.

Led the Human Factors input to the prime contractor for an Integrated Communications System.

Member of the technical programme committee and managed the administration of the symposium 'The Warship Manning Dilemma' at Abbey Wood Conference Centre, 19 Feb 1998.

Won BAe Innovation Award 1998 for project on flat screen console (with input from Glasgow School of Art - see below).

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Led the Human Factors input to the BAeSEMA study for the Defence Message Handling System, including manning analysis, organization design and HCI specification.

Supported a study into the Verification and Validation aspects of Knowledge Based Systems.

Led the Human Factors input to an experimental validation of a computer-based system for warship damage control. Conducted a scoping study into the use of the trials facility for the study of teamwork.

Conducted a study into the RN application of the USN Smart Ship Programme approach to warship manning.

Led a study on the ergonomics and usage of Closed Circuit Television (CCTV) on warships.

Led a study to produce ergonomic guidelines for hand held and portable devices, with a particular emphasis on data gathering and condition monitoring applications.

Contributed to a study to investigate the scope for commonality in future maritime Command Systems, with an emphasis on Intelligent Support Systems.

Responsible for the Human Factors Integration of the Propulsion aspects of the VSEL LORAL tender for Batch 2 Trafalgar Class.

Contributed to studies on the integration of Human Factors methods and software engineering methods, with particular emphasis on safety-related systems (including civil Nuclear systems).

Led a study to investigate the implications of adopting ISO 9241 for MMI requirements for Naval applications.

Technical lead on a study to define the MMI for a Remote Mine Hunting System, including Command System, sensor, actuator integration. The study included mission and task analysis, job and team organization, compartment, console and HCI design.

Devised the Human Factors plan for the project definition phase of the Bowman MIS terminal development.

Provided task analysis and interviewing methods for requirements capture for the New Scottish Centre for Air Traffic Control, as part of the development of CHORD (Comprehensive Human-machine Oriented Requirements Definition).

Contributed to the analysis of user requirements and information flow for ASTOR, with an emphasis on C3I aspects and co-ordination of decision making. Extensions to normal systems methods were used to characterise the human aspects. Soft Systems Method was used to help derive the model.

Led a study for an Ergonomically Designed Warship Bridge, with reduced manning, advanced technology and improved layout and visibility.

Led methods for total system analysis, allocation of function and task analysis using a Yourdon approach in an integrated CASE environment for the Combat Management System for the Future Frigate.

Human Factors work for the Integrated Platform Management System (IPMS) for the Future Frigate pre-PD study. Contributed to HF work on the Combat Management System (CMS) for The Future Frigate. Consultant to Human Factors aspects of Type 23 Command System (SSCS) and SSN20 IWS Feasibility

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Study. Involved in developing a set of guiding principles for MMI design, and the MMI structure for SSCS.

Sea-riding study into information flow and decision making at Force level (Admiral's staff), devised new approaches to the representation of high-level command decision-making. Investigated signal message handling problems, operational impact of communications delays, ways of examining staff workload.

Conducted a validation of user requirements for the User Knowledgebase Interface of the Technology Demonstrator System at DRA Portsmouth. This investigated user aspects of data fusion. Soft OR methods, including cognitive mapping and Checkland Soft Systems Method were used to explain system behaviour.

Produced a theoretical basis for the evaluation of command team organizations, building on management science approaches and taking account of recent developments in High Reliability Organizations. Contributed to the experimental evaluation of command team design, using the theoretical framework.

Investigated Human Factors aspects of advanced submarine manoeuvring room, with reduced manning, IKBS etc.

ALVEY project on MMI research issues in advanced industrial command and control systems. Research into Human Factors of IKBS, and the design requirements of intelligent support systems.

## 1974 - 1984 Westland Helicopters Ltd.

10 years Human Factors in the aircraft industry, responsible for MMI design of integrated mission (ASW, ASVW, ATGW), propulsion and vehicle systems, and impact of crew performance on operational effectiveness. Responsible for simulator trials management on R&D simulator complex. Technical lead on advanced cockpit project, using touch screens, speech I/O etc. and new construction technology. Research into workload assessment and prediction, new technology etc.

## Recent research and academic contacts

Brian has maintained an interest in supporting academic research and collaboration with Universities. Apart from his Honorary Professorship at the Digital Design Studio, Glasgow School of Art, recent examples of this include:

Supervision of doctoral research at the Digital Design Studio, Glasgow School of Art

Teaching 'communicating complex processes' to second year Product Design students, Glasgow School of Art December 2004.

Seminar at Centre for User Oriented IT-design (CID), Royal Institute of Technology (KTH), Stockholm, on 'Quality assessment, user orientation and lifecycle analysis' March 2004.

Supervision of research into intelligent agents at Dept. of Computer Science, Glasgow Caledonian University.

'Application of the Sheffield Method to Organizational Design of Help Centres' supervision of Occupational Psychology MSc project with the Institute of Work Psychology, University of Sheffield, 1998.

'Multifunction Submarine Control Console' MEng final year project Glasgow School of Art and Glasgow University, 1998 (winner of several awards).

'Ergonomics of portable analyser' BA final year project Glasgow School of Art.

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'Study into the possibility of using games technology to construct a Virtual Reality trainer' MSc in Computer Studies, Glasgow Caledonian University, 1997.

'Study into large display technology' MSc in Computer Studies, Glasgow Caledonian University, 1997.

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## Technical Publications

Brian has maintained a commitment to publish findings when this is appropriate, using conferences and other venues that are industry-related rather than academically focused. His talks and tutorials have received high ratings on attendee feedback forms.

In press: WWCS Maritime session

Lützhöft, M, Sherwood Jones, B, Earthy, J.V, Bergquist, C., 'MTO-Sea: Competent Cadets Make Safer Systems' RINA Conference Human Factors in Ship Design and Operation, March 2007, London

Sherwood Jones, B, Smith, R.P., Ives, R. 'Design of Container Ships for Safer Securing and Access' RINA 'Conference Design and Operation of Container Ships', November 2006.

Lützhöft, M, Sherwood Jones, B, Earthy, J.V, 'Making Safety by Tying the Knot: Examining Resilience in Shipping' Second Resilience Engineering Symposium, Antibes-Juan les Pins, France, November 2006

Talk on Usability Maturity to Scottish Usability Professionals Association, Sept 2006.

Chaired and initiated 'Maritime Ergonomics' session at IEA 16<sup>th</sup> World Congress, Maastricht, July 2006.

Sherwood Jones, B.M., Earthy, J.V. 'The role of ergonomics and the ergonomist in the maritime sector' IEA 16<sup>th</sup> World Congress, Maastricht July 2006.

Sherwood Jones, B., Naef, M., McLundie, M. and Ross, C. 'Interactive 3D environments for ship design review and simulation' COMPIT 2006, Delft, May 2006.

Sherwood Jones, B., Earthy, J. 'Design for the human factor; the move to goal based rules' World Maritime Technology Conference, March 2006.

Sherwood Jones, B., Earthy, J., Fort, E., Gould, D. 'Improving the design and management of alarm systems' World Maritime Technology Conference, March 2006.

Sherwood Jones, B., Earthy, J., Arnold, S., Chubb, D. 'The role of systems engineering in naval platform design and operation' World Maritime Technology Conference, March 2006.

Sherwood Jones, B. Johnston, I. 'Improving ship design reviews with immersive environments' Innovation Hour, World Maritime Technology Conference, March 2006.

Pomeroy, R.V., Sherwood Jones, B.M., 'Learning From Experience - Adopting A Systems Approach To The Analysis Of Marine Incidents' in RINA Conference 'Learning from Marine Incidents III' January 2006 Shorter version appeared in pp 60-65 'The Naval Architect' February 2006.

Earthy, J., Sherwood Jones B. and Rattenbury N. 'Assessing the Treatment of the Human Element within the Naval Class Regime' in RINA Conference 'Safety Regulations and Naval Class II' 23 - 24 November 2005

Sherwood Jones, B., 'Scientific Reasons for Human Error' Lloyd's List event 'Maritime Emergencies' 25 Oct 2005.

'Operability Cases for Ship Control' session at SEAS 2005, Nice, France, May 2005.

Sherwood Jones, B.M., Moore, W., 'Slips, Trips and Falls in the Maritime Sector' Ergonomics Society Conference, April 2005, Hatfield, in Bust, P.D., McCabe, P.T., (Eds.) Contemporary Ergonomics 2005, Taylor and Francis ISBN 0415374480 p490.

'Process Standards for Human Centred Design' presentation to NSA AIWG, 16 March 2005, Glasgow

Sherwood Jones, B.M., Anderson, P., 'Diversity as a Determinant of System Complexity' at Conference on Complexity in Design and Engineering, February 2005, Glasgow.

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'Twenty Years on the Wrong Heading Dead Ahead' RINA Conference Proceedings 'Human Factors in Design, Safety & Operation' February 2005, London.

'Addressing the Human Element: ISO 18152 and Defence contracts' Course given to DPA at Abbey Wood, February 2005.

Letter on Process Communication project, Preview Newsletter February 2005, INCOSE UK.

Book Review of 'Globalizing Technical Standards: Impact and Challenges for Occupational Health and Safety'. Edited by THEONI KOUKOULAKI and STEFANO BOY Ergonomics, Vol. 48, No. 3, 22 February 2005, 314 - 317

'Safe Bridge Watchkeeping' Lloyd's Register Naval Bulletin, January 2005.

'Standards for Human Centred Design - Their State of the Art and their Potential for Machinery Safety' IMechE Seminar 'Human Performance - The Designer's Role' 24 November 2004, Warrington.

Initial drafting of UK/Denmark Submission to IMO MSC79/6/7 Goal-Based New Ship Construction Standards Role of the human element. September 2004, London

Presentation on Human Centred Design Standards to Strike Warrior US/UK Working Group, 9 Sept 2004, Edinburgh

Presentation on use of 3D and visualisation to support C4I to Strike Warrior US/UK Working Group, 8 Sept 2004, Digital Design Studio, Glasgow School of Art.

Earthy, J.V., Sherwood Jones, B.M., 'An Alarming Situation' article in Lloyd's Register 'Horizons' magazine, Sept 2004.

Sherwood Jones, B.M 'Bridge ergonomics - Some anthropometric considerations for ISO TC8/SC5' Process Contracting Limited White Paper, May 2004.

Sherwood Jones, B.M., McCafferty, D.B., 'Anthropometry - Designing to fit the user' Alert! newsletter, published by the Nautical Institute, Issue No. 3 April 2004.

Workshop on 'Quality assessment, user orientation and lifecycle analysis' to Centre for User Oriented IT Design, KTH (Royal Institute of Technology), 3 March 2004, Stockholm.

Initial drafting of UK submission to IMO MSC78/18/3 'Role of the Human Element - Intent of SOLAS Regulation V/15 Principles relating to bridge design, design and arrangement of navigational systems and equipment and bridge procedures' 1 March 2004, London

Sherwood Jones, B.M., Earthy, J.V. "Human Centred Design. Opportunities and Resources' HSIAC Gateway XIV No 3, December 2003.

'An operability case for demonstrating safe and effective operation in the marine sector' talk at Ergonomics Society workshop on 'Human Factors issues in the Air Traffic Management System' 24 November 2003, Hurn.

'Human Centred Design and its role in e-Government' paper at panel session on '21<sup>st</sup> Century Government, A Citizen-centred approach' organised by Brian at ScotSoft 2003 (13 November 2003, Edinburgh).

'A user-centred design approach to the fitting of AIS' Alert! newsletter, published by the Nautical Institute, Issue No. 1 October 2003.

Sherwood Jones, B.M., Earthy, J.V., 'Using an 'Operability Case' to provide assurance of safe bridge watchkeeping' The Ergonomist June 2003, ISSN 0268-5639

Sherwood Jones, B.M., Earthy, J.V., 'A New Process Standard for HSI: Rationale, Outline and Benefits', in Human Systems Integration Symposium, HSIS 2003, Vienna, VA June 2003

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Sherwood Jones, B.M., Earthy, J.V., Arnold, S., 'Human Centred Design in a System Engineering Context' in McCabe, P.T. (Ed.) 'Contemporary Ergonomics 2003', London: Taylor and Francis, ISBN 0-415-30994-8

Pomeroy, R.V., Sherwood Jones, B.M., 'Managing the Human Element in Modern Ship Design and Operation', in 'Human Factors in Ship Design and Operation' Conference 2-3 October, London, UK. © The Royal Institution of Naval Architects. ISBN 0 903055 81 3

Arnold, S., Sherwood Jones, B.M., Earthy J.V. 'Addressing the People Problem - ISO/IEC 15288 and the Human-System Life Cycle' 12th Annual International INCOSE Symposium, Las Vegas, July 2002

Sherwood Jones, B., Earthy, J.V., 'The Processes to Manage (and minimise) the Human Risk in Complex Systems' Safety Critical Systems Conference in Redmill, F., Anderson, T. [Eds.] 'Components of System Safety' Springer, London, Feb 2002 ISBN 1-85233-561-0

White paper - 'Alarm and Warning Guidance - Synopsis of the EEMUA Guide, with related material'. WP003, Dec. 2001.

Arnold, S., Sherwood Jones, B.M., 'Systems Development Lifecycle and Process standards' Scottish INCOSE meeting 1st Scottish Systems Engineering Convention: Glasgow, Nov 29th 2001.

'How do I know I will get what I need?' Paper to Masterclass on 'Customer Driven Design' Scotsoft 2001, 7<sup>th</sup> Sept, Edinburgh.

EARTHY, J.V., SHERWOOD JONES, B. & BEVAN, N. (2001). The Improvement of Human-Centred Processes - facing the challenge and reaping the benefit of ISO 13407, International Journal of Human Computer Studies, Special Issue from HF 2000 Vol 55(4) October 2001 pp 553-552.

'Enabling and Maintaining Control' People In Control 2001, June, Manchester IEE CP 481 pp 201-205.

'Capability Maturity Model for HFI' 22 November 2000, 'Profiting from Human Factors' DMA Symposium. London.

'HFI Process Model' INCOSE Insight, April 2000.

'Evaluating HFI Capability and Improving HFI Processes' HFI Symposium, 5 November 1999, London.

J.V. Earthy, B.M. Sherwood Jones, J. Weston, Tutorial on Human Centred Design Processes and their improvement. Interact '99, Edinburgh August 1999.

B M Sherwood Jones, T McClean, D J Carr 'Communicating With Technology: Design Concepts for Future Platform Management' IEE People In Control '99 Conference June 1999

B. Sherwood Jones, J. Earthy, Y. Bowler, R. Taylor, M. Forster 'A Human Factors Integration Capability Maturity Model' INCOSE 99, Brighton, June 1999.

B Sherwood Jones, J.V. Earthy, 'Human-Centred Process Integration: The Process Maturity Perspective' IEE Colloquium 'Making user-centred design work in software development' March 1999 IEE99/010

Tutorial on 'Maturity in Human-Centredness: Measurement of an organization's attitude towards Human Factors' HCI '98, Sept 1998, Sheffield.

EARTHY, J. SHACKEL, B. COURTENEY, H. HAKIEL, S & SHERWOOD-JONES, B. TAYLOR, B., (1998). Human-Centred Processes, in MAY, J. *et al*, HCI'98 Conference Companion, adjunct proceedings of the 13<sup>th</sup> BCS annual conference on HCI, HCI'98, Held at Sheffield Hallam University, Sheffield, Sept. 1998, ISBN 0-86339-795-6

'Test Scenario for the application of human-centred tools, methods or metrics' feature in Interfaces 37, British HCI Group newsletter, Spring 1998.

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'Operating Space Concepts - A View from Industry' paper presented at the International Workshop on Design and Evaluation of Principal Operating Areas in Warships, DERA Portsdown West, April 1998.

B. Sherwood Jones, J. Earthy, 'Usability Process Measurement and Improvement' paper presented at ACQUIRE - ICT '98, City University February 1998.

'Why not look at it this way? A functional approach to warship design' paper presented at 'The Warship Manning Dilemma' MOD Abbey Wood Conference Centre, February 1998, and summarised in the Journal of Naval Engineering.

'The Ship Management Centre for Platform Management in Future Warships' paper presented at Eleventh Ship Control System Symposium, Southampton April 1997.

'CCTV Usage and Ergonomics' paper presented at Eleventh Ship Control System Symposium, Southampton April 1997.

D.F. Turner, A.E. Crawford, B.M. Sherwood Jones 'Trials to Validate a Damage Control Human Interface Standard' paper presented at Eleventh Ship Control System Symposium, Southampton April 1997.

'Co-operative decision making and team work in Command and Control: how can computers help and how do they get in the way?' IEE Colloquium 'Computer Mediated Complex Supervisory and Decision Making in Teams' April 1997.

'Usability Process Improvement' Software Process 96, Brighton, December 1996.

Safety Critical Systems Club 'Human Factors Standards - How little can you get away with? How much is right?' Oct 1996.

UK Evaluation Society National Conference 'Evaluation in an Engineering Context' Sept 1996.

1996 Ergonomics Society Annual Conference, ran workshop on Process Improvement in Human Factors Integration, April 1996.

Book review of "Cost Justifying Usability", Bias, R.G., Mayhew, D.J., Academic Press, 1994 in Ergonomics Abstracts, 1996, 28/4

Sherwood Jones, B.M., Harrison, J.A., 'Third Generation Control Centre Design' IEE Colloquium 'Control Rooms, Cockpits and Command Centres', 20 Feb 96, IEE Digest No: 96/033

'Total System Maturity', UK Software Process Improvement Network workshop on 'Practical Methods', Nov 1995.

'Practical Evaluation of complex Man-Machine Interfaces', IEE Colloquium 'Man-machine Interfaces for Instrumentation' Oct 1995.

'Standards for Trustworthy Human-Electronic Teamwork', 3rd International Workshop on Human-Computer Teamwork, Cambridge Sept 1994.

'Total System Evaluation - providing assurance of valid and useful results' NPL Usability Forum Workshop 'Usability Evaluation in Practice - 2' May 1994. London.

'Generic Man Machine Interface Standards' 10th Ship Control System Symposium, Ottawa Canada, Oct 1993.

Carr, D.J., Salway, A.F.S., Sherwood Jones, B.M., 'Safer by Design: A Framework for a Design Process Standard for vehicle MMI', ISATA 1993, Florence

McLeod, R.W., Sherwood-Jones, B.M., 'Simulation to predict operator workload in a command system'. Chapter 11 in 'A Guide to Task Analysis' Kirwan, B. Ainsworth, L.K. (eds), Taylor and Francis, 1992.

'A Theory of C<sup>2</sup> Organizations' (joint with J Holt, N Ferguson, CS Narborough-Hall, SD Brennen) IEE IDASCO Oxford 1992.

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'Validation of a Knowledge based System MMI' (joint with GN Brander) UDT 1992

Salway, A.F.S., Sherwood-Jones, B., Carr, D., and Upton, M. 'Usable Usability Standards'. Information Design Conference 5, London, April 1992.

'Time to Take the Operator as Manager Seriously', Ergonomics Society Annual Conference, 1990.

'Predicting operator Workload in Naval Command Systems' (joint with RW McLeod) MILCOMP 1989.

'Standardisation Needs for Interaction with Intelligent Systems' (Aircrew Station Coordination Committee WP10 Symposium 1986, IEE 1989)

'Implications for the Design Process of the Human Electronic Crew Concept' (The Human Electronic Crew : Can they work together?, Ingolstadt 1988).

'HCI Quality Plans' (BCS HCI Specialist Group 1987)

'Communication Using Video Techniques' (IEE Scottish Centre, 1985)

'Design of Multifunction Displays & Controls' (Displays Conference, London 1978).