

Recently Issued NRL Formal and Memorandum Reports

Throughput Maximization Under Quality of Service Constraints: Determination of Optimal Offered Load in Circuit-Switched (Wireless or Nonwireless) Communication Networks.

Controlled as **NRL FR-9922**

By Wieselthier JE (5520), Nguyen GD (5521), and Ephremides A (Pontos, Inc.)

from the Naval Research Laboratory

06/26/2000

Unclassified Report

Subjects: (U) Communications networks; Lagrangian functions; Optimization; Circuits; Throughput; Algorithms (U) QoS (Quality of Service); Lagrangian techniques

Abstract: (U) We consider the determination of the offered load that maximizes throughput in circuit-switched multihop networks, subject to Quality of Services (QoS) constraints on circuit blocking probability. This problem is of interest in network design for "sizing" the service capabilities that can be provided, and thereby providing a measure of "network capacity." Lagrangian techniques are used to formulate this nonlinear optimization problem, which incorporates nonlinear inequality constraints. We then describe a heuristic technique that guides the search more directly toward the optimal solution, thereby resulting in faster and more-reliable convergence. We show that the degree of increase in throughput obtainable when the optimal values of offered load are used varies greatly among the examples we have studied, and can be dramatic in some cases. We demonstrate the effectiveness and robustness of our approach by comparing 18 versions of our algorithm for several network examples. Finally, the relationships between admission control and optimization of offered load are discussed.

USS VIRGINIA Ballast Tank Connector Qualification Study.

Controlled as **NRL MR-8491**

By Lucas KE (6136), Hogan EA (GEO-Centers, Inc.), Slebodnick PF (6136), Thomas ED (6130), and Seelinger A (Naval Sea Systems Command)

from the Naval Research Laboratory

09/29/2000

Unclassified Report

Subjects: (U) Qualifications; Cathodic protection; Ship hulls; Anodes; Connectors (U) ICCP (Impressed Current Cathodic Protection); Metallic anode; USS VIRGINIA; MBT (Main Ballast Tank)

Abstract: (U) With the incorporation of impressed current cathodic protection (ICCP) into the main ballast tanks (MBT) aboard the USS VIRGINIA class hulls, it was necessary to design components which would provide optimal performance and durability within the harsh environment. As part of this effort, new ballast tank anodes were selected, which consist of a platinized niobium surface extruded over a conductive copper core. This anode style is highly versatile and can be utilized in long lengths and bends to facilitate installation in the difficult tank geometry.

Recently Issued Technical Reports

Workshop on Hyperspectral/Multispectral Sensors Measurement Modeling and Simulation.

Controlled as **NRL 601767**

from the U.S. Army Aviation and Missile Command, Attn:

07/00/2000

Unclassified Report

Subjects: Spectrum analysis; Multispectral; Modeling; Simulation; Target detection; Image processing; Processing; Lasers; Infrared lasers; Pulsed lasers; Broadband; Frequency; Detection Active/Passive lasers; SAL Semi-Active Laser; ATD (Automatic Target Detection); MMW (MilliMeter Wave); IIR (Imaging Infrared Radar); JOANNA (Joint Airborne Navigation and Attack); AOTF (Acousto-Optic Tunable Filter)

Recently Issued Intelligence Documents

Country Handbook - China.

Controlled as **NRL 601721**

from the Department of Defense

03/00/2000

Unclassified-OUO Report

Subjects: (U) China; Military assistance; Geography; Climate; Transportation; Communications and radio systems; Government (Foreign); Culture; Economics; Threats; Military forces (Foreign); Military training; History; Medical services; Far East; Hong Kong (U)

Abstract: (U) This handbook provides basic reference information on China, including the geography, history, government, military forces, and the communications and transportation network in China. This information is intended to familiarize military personnel with local customs and area knowledge in an effort to assist them during their assignment to China.