Supply-Chain Optimization Template

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The Supply-Chain Optimization Template (SCOT) is an instructional guide for identifying, evaluating, and optimizing (including re-engineering) aerospace-oriented supply chains. The SCOT was derived from the Supply Chain Council's Supply-Chain Operations Reference (SCC SCOR) Model, which is more generic and more oriented toward achieving a competitive advantage in business.

Utilizing NASA's Parachute Refurbishment Facility as an example, concepts contained in the SCC SCOR Model were modified and expanded to be applicable to the unique processes, restrictions, and regulations found in aerospace environments. Templates of the optimized processes were created, samples were developed, and validated effective processes of implementation were created. These templates, samples, and processes were integrated into a formal step-by-step set of descriptions of only those processes applicable in aerospace settings. The inclusion of these specific process steps, coupled with the exclusion of generic SCC SCOR Model process steps that are not applicable in aerospace settings, is expected to reduce the amounts of time needed to both optimize supply chains and train personnel to optimize supply chains.

This work was done by William F. Quiett and Scott L. Sealing of United Space Alliance for Johnson Space Center. Further information is contained in a TSP (see page 1). MSC-23423-1

Algorithm for Computing Particle/Surface Interactions

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An algorithm has been devised for predicting the behaviors of sparsely spatially distributed particles impinging on a solid surface in a rarefied atmosphere. Under the stated conditions, prior particle-transport models in which (1) dense distributions of particles are treated as continuum fluids; or (2) sparse distributions of particles are considered to be suspended in and to diffuse through fluid streams are not valid.

In the present algorithm, individual particle/surface interactions are modeled. The algorithm uses a few key parameters that can be determined experimentally for the particles of interest in a given application: These parameters are the coefficient of restitution, coefficient of transfer of momentum, diffusivity, and sticking velocity. If many representative particles are tracked through modeling by use of this algorithm, a statistically likely distribution of particles can be obtained.

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