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Delta II costs hit McDonnell

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Production problems have contributed to Delta II cost overruns

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he US Air Force has revealed
that McDonnell Douglas
(MDC) is experiencing a cost
overrun on its contract to build
the Delta II launch vehicle (see P
39). The company has informed
the Air Force that it predicts an
excess of $140 million at comple-
tion of the contract, of which the
US Air Force concludes it is only
responsible for $94 million.
The overrun is the result of
production startup problems
with insufficient tooling; short-
ages of parts and staffing; in-
correct estimates by MDC of
subcontractor prices and of
production and employment
costs; and technical problems
during development and
qualification, says the USAF.
MDC won an initial $316 mil-
lion contract to build seven Delta
II medium-launch vehicles
(MLVs) in 1987 and this was

Freedonfs solar a

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olar arrays similar to those
which will power Space Sta-
tion Freedom have been tested
successfully in a simulated space
environment at NASA's Lewis
research center. The tests eval-
uated the panels' performance in
conditions similar to the plasma
environment of space at low
Earth orbit.
Research has shown that there
can be electrical interactions be-
tween a space-plasma environ-
ment and a solar-cell power
source which can cause short-
circuiting and arcing problems.
The effects of interactions on the
materials and the operational
characteristics of the panels had
to be evaluated for the best
design of the arrays.
The two solar-array panels,
each containing two hundred
8cm2

silicon solar cells, have
been developed by Lockheed arid
tested in a vacuum chamber at
the research centre. While sub-
jected to temperatures of 25°-
40°C, the panels have also been
illuminated by a solar simulator
which produces a solar intensity
of 0.3 sun. The arrays were also
operated while being exposed to
plasma with ion densities of 100
to 1 million ions per cm3

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increased by 13 further vehicles,
worth $669 million. Additional
incentive awards of $3 million a
successful launch are due to
MDC and there have been five in
five attempts so far. A $1 million

a year payment is made il all
contractual terms are met.
One failure will kill off all
incentives and two will halve
MDC's profits. Three will negate
them altogether. •

Soviets reveal

lunar vehicle

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S scientists visiting Moscow
inadvertently became the
first Westerners to see the
manned lunar and command
modules that were to have been
used to stage a Moon landing in
1967, two years ahead of the
United States' mission.
The MIT scientists saw the
modules at the Moscow Aviation
Institute and were told that the
lunar programme would have in-
volved the launch of the lunar
landing module and rocket stage
on board the Nl heavy booster,
with a two-man crew aboard a
Soyuz spacecraft launched on an
SL-4 booster. They were to ren-
dezvous and dock in Earth orbit
before being sent on a translunar
coast to lunar orbit.
One man would have re-
mained in lunar orbit and one
would have walked on the Moon.
The landing vehicle had a triple
redundancy feature. The return
to Earth and landing in a Proton-
launched Soyuz descent capsule
was tested •

GEC and Matra

join space

companies
GEC and Matra are to set up a

joint company to combine
their space systems interests with
the prospect of winning annual
sales of £300 million. The new
company will be called Matra
Marconi Space and will bring
together Matra Espace and Mar-
coni Space Systems.
Matra will take a 51% stake in
the joint company, although
GEC could raise its stake to 50%
if collaboration between the part-
ners is extended. Co-operation
between the two companies is
aimed at capturing a greater
share of the international space
systems market and will establish
Matra Marconi Space as the lead-
ing European satellite commu-
nications group.
The joint company will
employ 2,700 people in the two
countries. Matra will put in
£10.7 million and GEC £8.7 mil-
lion to establish the venture. D

The panels have been tested in the "space-like" environment of Lewis' vacuum chamber

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