

NEW WORLD

Change of Tack on the Shuttle

by our Washington Correspondent

THE long and convoluted debate about the space shuttle has taken a strange and confusing turn. A Congressional agency has taken a damaging swipe at NASA's economic justification for the project, but NASA officials, undaunted, have come up with a fresh analysis claiming that the shuttle is an even better economic bet than they had previously thought. In Congress, meanwhile, critics of the shuttle are arming themselves with a new set of arguments to use when NASA's budget comes up for debate in the Senate, but even the project's staunchest opponents are privately conceding that they have little chance of choking off the funds this year, at least.

What it all adds up to is more confusion in an already confused situation. By now, the shuttle is perhaps the most intensely studied technological project to come before Congress, but as an example of prudent science policy making, the whole debate leaves a lot to be desired, chiefly because it has been concerned almost exclusively with the economics of the project while its wider implications have been underplayed. The real issue is the shape and balance of the US space programme for the rest of the century.

Congressional opponents of the shuttle, led by Senator William Proxmire and Senator Walter Mondale, last year set the General Accounting Office the task of examining the basis of NASA's claims that development and use of the shuttle will save the agency money when compared with the cost of launching satellites with conventional, expendable rockets. The GAO has some harsh things to say about NASA's figures, but its report, published last week, is remarkable chiefly for the fact that it reveals for the first time that NASA has recently come up with a completely new economic analysis of shuttle operations.

When the final shuttle design was chosen last year, NASA argued that although it would cost some \$8,100 million to develop and produce, use of the shuttle would save some \$5,200 million between 1978 and 1990. The analysis rested on the assumption that NASA's budget would be able to support 581 shuttle flights in that period, and that the chief savings would result from the fact that the shuttle will enable satellites to be repaired and refurbished after they had been placed in orbit, and from removal

of size and weight constraints in payload development. But, on April 27—three days before the GAO originally intended to publish its report—NASA sent the accounting office a completely new mission model. Instead of 581 shuttle flights up to 1990, the agency is now suggesting that its budget will be able to support 779, and the estimated savings have shot up from \$5,200 million to about \$16,000 million.

GAO has not had time to examine these drastically modified estimates in detail, and the effect has been to torpedo, to some extent, its analysis of NASA's original estimates. The new mission model has neither been explained in detail by NASA nor subjected to independent analysis, but according to Mr Dale Myers, head of the Office of

Manned Spaceflight, one of the chief differences from the original model is that it assumes that one third of the shuttle flights will be sortie missions, using the spacelab which will probably be developed by the European Space Research Organization (see *Nature*, 241, 418; 1973).

The spacelab is a pressurized capsule in the shuttle payload bay, which will house up to six scientists, and an unpressurized unit that will be used for large instruments such as telescopes and antennae. The unit will remain attached to the shuttle throughout the mission and will be removed on landing and prepared for the next flight. Mr Myers said in a telephone interview last week that the spacelab is expected to reduce payload costs substantially, so that more

AIR POLLUTION

Relief for Detroit

by our Washington Correspondent

THE Environmental Protection Agency last week published some data to back up its assertion that nitrogen dioxide does not present a widespread air pollution problem in the United States. In fact, the agency now reckons that only two cities have levels of nitrogen dioxide that pose a potential hazard to health, while a year ago 47 regions were accorded that distinction. Sighs of relief were clearly audible in Detroit at the EPA's reappraisal of the situation.

The reason for the rather dramatic change in the status of nitrogen dioxide is that the method that was originally used to measure concentrations of the pollutant in the air has recently been found to have given greatly elevated readings. The result is that only Los Angeles and Chicago are now reckoned to have levels of nitrogen dioxide greater than $100 \mu\text{g}^{-3}$, the level above which it is considered to be harmful to health. There is also some question about New York and Salt Lake City, where the EPA is rechecking its measurements.

The importance of all this for the automobile manufacturers is that the Clean Air Act commands them to produce cars in 1976 which emit 90 per cent less oxides of nitrogen per mile than those produced in 1971. That requirement was based on the original faulty measurements, and the manufacturers are now claiming that such stringent controls are not necessary. In order to meet the requirements of the act, the

car makers would have to fit a second catalyst to the conventional engine, in addition to the converter needed to remove hydrocarbons, and a committee of the National Academy of Sciences reported recently that there is considerable doubt about the reliability of the dual catalyst system.

The EPA's new analysis suggests that even if no stricter automobile emission controls than those now in operation are applied, only Baltimore, in addition to Los Angeles and Chicago, will have levels of nitrogen dioxide in 1985 that exceed the $100 \mu\text{g}^{-3}$ level. The EPA is allowing 45 days for comments on its new analysis, after which it will turn all the data over to Congress with a suggestion that the requirement for 90 per cent reduction in exhaust emissions be modified. The chances are that Congress will probably end up modifying the Clean Air Act so that car makers will still have to reduce emissions of oxides of nitrogen substantially, but not to the extent of fitting dual catalyst systems to car exhausts.

In the meantime, however, the EPA must hold public hearings and decide whether or not Chrysler should have an extra year to meet the present standards prescribed by the act. As with hydrocarbon emissions standards (which are not affected by the reappraisal of oxides of nitrogen) the EPA Administrator can grant manufacturers an extra year to comply if he finds that the technology for meeting with standards is not available, and late last month Chrysler requested such an extension. The EPA's decision must be made by August 29.