

a dish is formed, it has to be right the first time."

MacPherson has been "right the first time" often enough to have reached a sales level requiring expansion of production facilities. Plant expansion, however, is a considerable undertaking and means heavy capital expense — sometimes not recovered for many years. "Because we are small and highly specialized, press manufacturers are not anxious to produce machines for us. Our most likely supplier is in West Germany — they manufactured the press and manipulator we use at present. Now, however, because of general world price rises, time delays and the like, another import would be prohibitively expensive for us. Also, we wanted to keep the job in Canada, if that were possible."

Instead of importing a new press, Bob McIntyre considered building his own with enlarged capacity and improved features. He turned to Tom Andrews of the Kingston TIS office who suggested utilizing the SESP program through Queen's University. By locating a qualified engineering student and setting him the task the Company needed to complete, capital costs could be sharply reduced and the student could gain valuable experience. Both the student, George Malburg, and an advisor, Prof. H.V. Wevers, were engaged to provide the design.

According to Professor Wevers, the Company was fortunate in having a well defined task to accomplish. "It is easy to go astray through lack of definition in a project like this," he says. "Mr. McIntyre imparted what was needed and we enjoyed the added advantage of existing facilities and operator input creating a 'springboard' for us to start the project. Building a press is not an assembly line technique — even for a press manufacturer. Like them, we followed a series of particular steps in producing the design. In effect, we confirmed a number of our theoretical calculations by checking them against similar commercial designs. That was comforting background for successive steps."

A fortuitous mishap for the project was the failure of the hydraulic cylinder in the existing press. Engineering student George Malburg interrupted his work designing the new press to tackle the new problem. "The old press and the new design have similar size and pressure requirements," he notes. "Instead of purchasing an 'off-the-shelf'

replacement, we designed our own and had it built. We had more advanced materials available to us than we used in the old cylinder, resulting in considerable savings. In all, by building instead of buying, we halved the replacement price, gained good experience toward finishing the new unit and were provided with a happy indication that the company had made the right decision to design a new press.

"Contracting out for the replacement cylinder and other parts provided another benefit," notes Malburg. "We received numerous helpful engineering suggestions from subcontractors. Our situation under SESP allowed us close interaction with industry and the university. Not many firms have that advantage. Engineering design requires an open mind to fresh ideas. Bringing industry and universities together through the SESP program virtually ensures reception of new input."

"If anything," comments Company president McIntyre, "SESP enabled us to follow through on the commitment to finish what we undertook. It's true that our original concept was more than we could fulfill. We would like to have built a combination hot and cold forming press, but the hot forming process had problems we could not overcome. That part will be the next phase of our expansion program and I hope George Malburg will be here to help us with that as well."

"Our feeling," concludes Professor Wevers, "is that government spending

on any technical assistance to small companies like this one is money well spent. Although it's not a major investment of government funds, it produces significant results through a multiplier effect for this Company and the subcontractors. The project not only helped Mr. McIntyre's firm, it was a good demonstration of what Queen's University had to offer. We found the role of TIS useful in judging the value of suggestions, and benefitted from Council and its information sources. The program is as useful to the student as to the company. He gains valuable field experience and we teachers use it as a source of examples in our classrooms."

In 1981, the SESP program enters its fourth year as a linkage program between industry and the universities. For C.E. Macpherson Company, SESP means that they are no longer reliant on foreign imports for production tools, which greatly reduces their capital investment. For George Malburg, SESP means a headstart in his career. □

**Stephen A. Haines**

**Metal discs 2 cm thick are beaten into domes by this hammer driven by the new press.**

**Des disques de métal de 2 cm d'épaisseur, façonnés à l'aide de ce marteau-pilon actionné par la nouvelle presse, prennent une forme convexe.**

