

VON KARMAN INSTITUTE FOR FLUID DYNAMICS, BRUSSELS.

"OPERATIONAL AND TECHNICAL ASPECTS OF AMPHIBIOUS HOVERCRAFT"

by L. R. Colquhoun, Managing Director, Hoverlloyd Ltd.

TO SOME EXTENT THIS PAPER IS QUITE DIFFERENT FROM OTHERS READ AT THIS SYMPOSIUM. ITS DIFFERENCE LIES IN THE FACT THAT IT CONCERNS THE TRANSLATION INTO COMMERCIAL FACT OF THE INTERESTING AND VARIED THEORIES THAT HAVE BEEN THE MAIN BASIS OF MOST OF THE PAPERS.

IN HISTORY HOVERLLOYD'S INTEREST IN HOVERCRAFTING ACROSS THE CHANNEL GOES BACK TO 1965 WHEN THE COMPANY'S SWEDISH PARENTS PLACED AN ORDER WITH WESTLAND AIRCRAFT LTD. HOVERCRAFT DIVISION, NOW THE BRITISH HOVERCRAFT CORPORATION, FOR TWO SRN-4S. THIS WAS INDEED A COURAGEOUS DECISION SINCE AT THAT TIME THE SRN-4 WAS STILL AN INCOMPLETE DESIGN. IT SHOWED TREMENDOUS FAITH IN THE ABILITY OF THE MANUFACTURER TO TRANSLATE HIS THEORY INTO PRACTICE.

FIVE YEARS HAVE NOW GONE BY AND AFTER A SHAKY START IN 1968, WHEN THE SRN-4 WAS INTRODUCED TO THE PUBLIC FOR THE FIRST TIME AT TOO EARLY A STAGE IN ITS DEVELOPMENT, PROGRESS HAS BEEN MADE TO THE POINT WHERE IT IS COMPLETELY ACCEPTED BY THE PUBLIC AS A NORMAL METHOD OF CROSSING THE CHANNEL AND IS SHOWING SIGNS OF BEING ABLE TO DO SO AT A PROFIT TO THE OPERATOR. TO A GREAT EXTENT THEREFORE THIS PAPER IS AN ACCOUNT OF HOW HOVERLLOYD HAVE REACHED THIS POINT.

FORTUNATELY, WHEN THE ORDER FOR THE SRN-4S WAS FIRST PLACED A FURTHER DECISION WAS TAKEN TO RUN A SUMMER-ONLY

SERVICE WITH THE SMALL SHELTERED WATER SRN-6. THIS WAS TO BE IN 1966 AND 1967 WITH THE INTENTION OF STARTING THE SRN-4 SERVICE IN 1968. THERE WERE MANY IN THE HOVERCRAFT INDUSTRY, AND I AT THE TIME WORKING FOR VICKERS HOVERCRAFT DIVISION WAS ONE OF THEM, WHO THOUGHT THAT AN SRN-6 SERVICE ACROSS THE CHANNEL WAS HAZARDOUS IN THAT THERE WAS A REAL POSSIBILITY OF THE CRAFT, WHICH AFTER ALL WAS DESIGNED ONLY FOR SHELTERED WATER OPERATION, BEING SEVERELY DAMAGED BY THE SEAS THAT ONLY THE CHANNEL CAN GENERATE.

FINDING MYSELF IN THE POSITION OF RUNNING THE SERVICE IN 1966 WAS THEREFORE A GREAT CHALLENGE, NOT ONLY TO BUILD UP A COMPANY FROM NOTHING BUT TO ENSURE ITS DEVELOPMENT WITHOUT AN INCIDENT THAT COULD BE DETRIMENTAL TO ITS IMAGE. IT WAS CLEARLY OBVIOUS FROM THE SRN-6 TRIALS CARRIED OUT PRIOR TO THE FIRST PASSENGER OPERATIONS, WHICH STARTED IN MAY, THAT WINDS ABOVE BEAUFORT SCALE FORCE 4 WOULD GENERATE WAVES THAT WOULD BE BEYOND THE COMFORT THRESHOLD FOR THE NORMAL PASSENGER. FROM THE SAFETY ASPECT HOWEVER, THESE TRIALS SHOWED THAT THE SRN-6 WAS REMARKABLY SEAWORTHY AND OPERATIONS IN FORCE 7 WINDS AND SEAS UP TO 6-7 FEET WERE POSSIBLE. THE ONLY WORRY WAS THAT WITH ONLY ONE ENGINE IF THIS SHOULD FAIL A DIFFICULT RESCUE OPERATION WOULD BE NECESSARY.

DURING THE TWO YEARS OF SUMMER CHANNEL OPERATIONS HOVERLLOYD AMASSED 1,500 CROSSINGS AND WITH THEM A WEALTH OF EXPERIENCE UPON WHICH TO PLAN THE REAL PASSENGER OPERATION WITH THE SRN-4. THE WEATHER FACTORS AND THE EFFECT THEY HAD ON SEA STATES AND THE FURTHER RELATIONSHIPS THESE HAD WITH

THE DIRECTION OF THE TIDE WERE EXPERIENCED AND ANALYSED. THESE ANALYSES WERE THEN CROSS REFERRED TO INFORMATION OBTAINED FROM OFFICIAL SOURCES AND, ASSUMING THAT THE MANUFACTURER'S CLAIM THAT THE SRN-4 COULD OPERATE IN WAVES UP TO $2\frac{1}{2}$ METRES WAS CORRECT, IT WAS POSSIBLE TO DEDUCE THAT THE ACTUAL AVERAGE OF CROSSINGS CANCELLED DUE TO WEATHER WOULD BE AROUND 5%. IT IS INTERESTING TO RECORD THAT IN 1970 THE ACTUAL CANCELLATION RATE WAS 3.9%.

IN ADDITION NAVIGATIONAL PROCEDURES WERE ESTABLISHED, PARTICULARLY WITH REGARD TO TYPES OF EQUIPMENT AND TO MINIMISING THE COLLISION PROBLEM OF OPERATING FAST CRAFT IN RELATIVELY CONGESTED WATERS. THE LATTER WAS REGARDED BY MOST PEOPLE AS AN ALMOST INSOLUBLE PROBLEM BUT IN THE EVENT IT HAS NOT PROVED ANYWHERE NEAR SO DIFFICULT AS HAD BEEN PREDICTED.

HOWEVER OUR EXPERIENCES WITH THE SRN-6 UNDERLINED THE BASIC PROBLEM OF OPERATING AMPHIBIOUS CRAFT FROM WITHIN THE CONFINES OF A CONVENTIONAL HARBOUR. IT WAS IMMEDIATELY APPARENT THAT NEGOTIATING THE ENTRANCE TO RAMSGATE HARBOUR WAS DIFFICULT ENOUGH WITH AN SRN-6: THE PROSPECTS WITH AN SRN-4, ABOUT FOUR TIMES THE WIDTH AND THREE TIMES THE LENGTH WERE FORMIDABLE AND CERTAINLY NOT ACCEPTABLE ON COMMERCIAL GROUNDS. IN ADDITION THE A LA MODE DESIGN FOR A HOVERPORT FOR AMPHIBIOUS CRAFT IN 1966 WAS A CONVEX SEGMENT AKIN TO A SECTION OF AN UPTURNED SAUCER. THIS WAS PROBABLY A SPLENDID IDEA FOR THE HOVERTRAVEL HOVERPORT AT RYDE ON THE ISLE OF WIGHT, WHERE THE SLOPES WERE VERY GENTLE, BUT IN