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A. 1201-3

B. SINCE LATE JULY [ ] HAS BEEN TESTING TO DETERMINE THE EFFECTS ON EXPOSED ROLLS OF 1414 FILM OF DEEP SUBMERGENCE IN SEA WATER. THE PURPOSE OF THE TESTING IS TO PRE-ESTIMATE THE CONDITION OF THE FILM IN R/V 1201-3 WHICH IMPACTED THE SEA JULY 10. THE R/V SANK IN APPROXIMATELY 15000 FEET OF WATER WHERE THE TEMPERATURE IS 2 TO 4 DEGREES C AND PRESSURE IS ABOUT 400 ATMOSPHERES. THE FILM PAYLOAD IS BELIEVED TO BE EXPOSED TO THE WATER AND IT IS ESTIMATED THAT IT WILL BE A TOTAL OF APPROXIMATELY 90 DAYS SUBMERGENCE BEFORE RECOVERY CAN BE ACCOMPLISHED. [ ] TESTING ADDRESSES BOTH THE PROBLEMS OF OF SENSITOMETRIC CHANGE AND THE POTENTIAL MECHANICAL PROBLEMS OF HANDLING THE FILM. SOME OF THE TESTS ARE CONTINUING AND THE RESULTS WILL BE REPORTED AS APPROPRIATE. TESTING HAS CONSISTED OF SUBMERGING FILM BOTH IN ROLL FORM AND IN LOOSE STRANDS UNDER CONDITIONS WHICH INCLUDE PRESSURES FROM ATMOSPHERIC TO 6500 PSI, TEMPERATURES FROM 2C TO 28C WITH IMMERSION TIMES UP TO 45 DAYS.

Approved for Release  
Historical Collections Division  
AR 70-14, 1 AUG 2012

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C. TESTING AT  HAS REVEALED THE FOLLOWING INFORMATION:

SEA WATER DIFFUSES INTO THE SIDES OF A SUBMERGED ROLL OF FILM. THE RATE OF DIFFUSION APPEARS TO BE INDEPENDENT OF PRESSURE BETWEEN 1 AND 13 ATMOSPHERES AT .100 TO .125 INCH PER WEEK AFTER A HIGH RATE FOR THE FIRST WEEK. EXTRAPOLATED DATA INDICATES TOTAL PENETRATION ON EACH SIDE OF JUST OVER 2 INCHES IN 90 DAYS.

PHYSICAL MANIFESTATION OF THIS DIFFUSION IS THE SWELLING OF THE EMULSION WHICH RESULTS IN DEFORMATION OF THE ROLL AT THE EDGE WHICH LOOK LIKE FLANGES OR "EARS" ON THE ROLL. THE SUPPORT IS STRETCHED ALONG THE EDGES WHICH WILL CAUSE SEVERE IMAGE DISTORTION.

SENSITOMETRICALLY, THE DEFORMED EDGE HAS TWO DISTINCT AREAS. ONE IS THE EXTREME EDGE WHERE THE FILM DEVELOPS UP TO A VERY HIGH DENSITY. THIS AREA IS A NARROW STRIP ABOUT 0.265 INCH WIDE ALONG EACH EDGE OF THE WEB. THE OTHER AREA IS AN AREA OF LOW DENSITY AND ENCOMPASSES THE REST OF THE EDGE WHERE WATER HAS DIFFUSED.

THERE MAY BE SOME RECOVERABLE IMAGERY IN THIS AREA, BUT THERE IS AN APPARENT SPEED LOSS OF ABOUT ONE STOP. THE DRY, CENTRAL PORTION OF THE WEB APPEARS NORMAL BOTH PHYSICALLY AND SENSITOMETRICALLY.

WHERE DIRECTLY EXPOSED TO SEA WATER, THE EMULSION IS DETACHED FROM THE SUPPORT AND SOMETIMES DISSOLVED. THIS HAPPENS AT THE EXTREME

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EDGE OF SOME OF THE CONVOLUTIONS AND ON THE LOOSE OUTER WRAPS ON A ROLL. THIS MAY BE ALL OR PARTIALLY A FUNCTION OF BIOLOGICAL ACTIVITY. TESTS WITH ROLLS SUBMERGED AT A PRESSURE OF 400 ATMOSPHERES INDICATE A STRONG TENDENCY OF SPOKING OF ROLLS. SPOKING IS A RADIAL DEFORMATION ALONG ONE OR MORE LINES, AND APPEARS AS AN INTERRUPTION OF THE ANNULAR CONVOLUTIONS. THIS COULD LEAD TO GREATER PENETRATION OF WATER INTO THE ROLL ALONG THE SPOKE LINE. THE DEGREE OF SPOKING APPEARS TO BE DEPENDENT ON ROLL TIGHTNESS AMONG OTHER THINGS, SO IS UNPREDICTABLE IN ACTUAL PAYLOAD.

D. PRELIMINARY CONCLUSIONS OR PREDICTIONS HAVE BEEN REACHED WHICH ARE AS FOLLOWS:

(1) IF THE FILM REMAINS IN A SOLID (INTELESCOPED) ROLL DURING DEEP SUBMERGENCE, IT IS POSSIBLE TO RECOVER UP TO ONE-HALF THE IMAGERY, IN GENERAL, FROM A STRIPE DOWN THE CENTER OF THE WEB. THERE WILL BE CONSIDERABLE SUPPORT DEFORMATION ALONG THE EDGES OF THE FILM AND POSSIBLY SOME LOSS OF EMULSION ALONG THE EXTREME EDGES.

(2) IF THE ROLLS DO NOT REMAIN INTACT, THOSE PORTIONS OF THE FILM EXPOSED DIRECTLY TO SEA WATER WILL NOT CONTAIN RECOVERABLE IMAGERY DUE EITHER TO EXCESSIVE FOG OR TO THE LOSS OF THE EMULSION FROM THE SUPPORT.

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E. ALTHOUGH TEST RESULTS DEMONSTRATE RATHER CONCLUSIVELY THAT MUCH OF THE FILM'S INFORMATION CAPACITY WILL BE IRRETRIEVABLY LOST, WE DO NOT ADVOCATE DISCONTINUANCE OF RECOVERY EFFORT. IN THE EVENT OF RECOVERY,  WOULD ADVOCATE KEEPING THE TEMPERATURE OF THE PAYLOAD AS LOW AS PRACTICABLE IN ORDER TO KEEP CHEMICAL AND BIOLOGICAL ACTION AT A LOW LEVEL OF ACTIVITY.

F. A BRIEFING ON OUR FINDINGS TO DATE WILL BE SCHEDULED FOR PRESENTATION TO THE CCB ON 23 SEPT, HOWEVER, ADDITIONAL BRIEFINGS ON UP-DATED FINDINGS CAN BE MADE AVAILABLE UPON REQUEST.

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