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FM UKMIS VIENNA

TO DESKBY 130800Z FCO

TELNO 79

OF 121832Z MAY 86

INFO IMMEDIATE WASHINGTON, MOSCOW, UKREP BRUSSELS

File

MIPT

1. AT DR BLIX'S BRIEFING MEETING FOR MISSIONS ON 12 MAY ROSEN STATED THE FOLLOWING:

(A) THE SITUATION AT CHERNOBYL APPEARS TO BE COMING UNDER CONTROL. THE TWO MAIN SOVIET FEARS HAD BEEN A CORE MELT-THROUGH AND ANOTHER CHAIN REACTION LEADING TO A FURTHER DISPERSION OF RADIATION. THE SECOND OF THESE HAD BEEN THEORETICALLY POSSIBLE BUT THE SOVIETS WERE NOW CONFIDENT THAT IT WAS UNLIKELY. THE FIRST WAS BECOMING INCREASINGLY UNLIKELY AS THE CORE TEMPERATURE AT UNIT 4 DECREASED.

(B) THE STRUCTURAL SUPPORT WAS BEING GIVEN TO THE UNDER-REACTOR AREA.

(C) THE GROUND AROUND THE REACTOR WAS BEING FROZEN.

(D) AN INERT ATMOSPHERE OF NITROGEN WAS BEING APPLIED TO THE CORE TO PREVENT FURTHER BURNING.

(E) THE LATEST SOVIET STATEMENT THAT THE SITUATION WAS NOW UNDER CONTROL SEEMED REASONABLE.

(F) CAUSE OF ACCIDENT: THE SOVIET AUTHORITIES HAD RECOVERED THE CONTROL ROOM DATA WHICH SHOWED NO PRECURSORS. THE REACTOR WAS AT 200 MEGAWATTS WHICH WAS ITS SHUTDOWN CONDITION (SEE BELOW). THERE WAS AN EXPLOSION WHICH TOOK THE ROOF OFF THE REACTOR AND CAUSED THE OVERHEAD 200 TONNE WEIGHT CRANE TO FALL INTO THE REACTOR CAUSING FURTHER DAMAGE. THE SOVIETS WERE STILL ANALYSING THE DATA AND WERE CLOSE TO IDENTIFYING THE CAUSE OF THE EXPLOSION, BUT WERE NOT READY TO GIVE THEIR CONCLUSIONS UNTIL REASONABLY CERTAIN. WHEN PRESSED BY CERTAIN REPRESENTATIVES ROSEN SAID THAT THE MOST LIKELY CAUSES WERE EITHER:

(I) A LACK OF COOLANT, WHICH CAUSED THE BREAKDOWN OF THE ZIRCONIUM CLADDING ALLOWING STEAM AND GRAPHITE TO COME INTO CONTACT SEMI COLON OR

(II) AN INCREASE IN REACTIVITY.

THE SOVIETS WERE CERTAIN THAT THE ACCIDENT ORIGINATED INSIDE THE REACTOR AND WAS NOT THE CONSEQUENCE OF AN EVENT FROM OUTSIDE.

(G) HEALTH EFFECTS: ON THE BASIS OF THE INFORMATION NOW COLLECTED IT WAS REASONABLE TO CONCLUDE THE FOLLOWING:

(I) OUTSIDE SOVIET UNION: NO MEASURABLE OR OBSERVABLE EFFECTS WERE EXPECTED.

(II) POLAND: THERE WAS NO REQUIREMENT FOR INTERVENTION, BUT THE LACK OF INFORMATION ABOUT THE ACCIDENT RESULTED IN THE MEASURES TAKEN.

(III) KIEV: THE LEVELS WERE APPROXIMATELY 10 TIME BACKGROUND AND IT WAS EXPECTED THAT THE EFFECTS WOULD NOT BE MEASURABLE OR OBSERVABLE.

(IV) CHERNOBYL: IT WAS LIKELY THAT THERE WOULD BE ADDITIONAL HEALTH EFFECTS. 204 SITE WORKERS AND FIRE FIGHTERS RECEIVED

*(RADIATION)***CONFIDENTIAL**

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RADIATION EXPOSURE IN EXCESS OF 100 REM. THESE HAVE BEEN TRANSFERRED TO MOSCOW FOR TREATMENT

(H) THERE WERE 3 FAVOURABLE CONDITIONS THAT HELPED REDUCE LEVELS OF EXPOSURE AT CHERNOBYL:

(I) THE TIME: AT 1.23 AM MOST OF THE POPULATION WERE INDOORS ASLEEP. BEING INDOORS REDUCED THE LEVEL OF EXPOSURE BY AN APPROXIMATE ORDER OF 10.

(II) THE HIGH REACTOR TEMPERATURE: THIS SENT THE INITIAL PLUME OF RADIATION UPWARDS TO HEIGHTS OF 1500 METRES.

(III) THERE WAS NO RAIN.

ROSEN WAS CAREFUL NOT TO POSTULATE ON LIKELY CASUALTIES UNTIL ALL THE FIGURES HAD BEEN PROVIDED.

(I) FOLLOWING THE ACCIDENT, THE SOVIETS RE-EXAMINED THE DESIGN OF THE CHERNOBYL REACTOR AND FOUND NO DESIGN FLAW. OPERATING PROCEDURES WERE BEING REVIEWED AT SIMILAR REACTORS AND STRINGENT ALERT PROCEDURES HAD BEEN ADOPTED.

2. AT A PRIVATE MEETING BEFOREHAND FISHER PUT TO ROSEN NED'S QUESTIONS (FAX DATED 12 MAY). HE ANSWERED AS FOLLOWS:

(A) ACCIDENT SEQUENCE: THE REACTOR HAD BEEN AT FULL POWER. IT WENT THROUGH ITS SHUT DOWN PROCEDURES WHICH TOOK TWO AND A HALF HOURS. IT WAS NOT TAKEN TO ZERO POWER BUT TO 7% THERMAL (200 MEGAWATTS THERMAL) WHICH WAS THE USUAL BOTTOM POINT WHEN THE INTENTION WAS TO TAKE THE REACTOR UP TO FULL POWER AGAIN. GOING BELOW THIS POINT CAUSES A BUILD UP OF XENON GAS FROM THE FISSION BY-PRODUCTS AND THE REACTOR HAS TO WAIT FOR THE GAS TO DECAY. THIS WAS NOW THE AGENCY'S CONSIDERED ASSESSMENT.

(B) THE ACCIDENT APPEARS TO HAVE BEEN CAUSED BY A STEAM EXPLOSION IN THE CORE, WHICH, IN TURN, WAS A CONSEQUENCE OF AN INCREASE IN REACTIVITY. THE LACK OF PRECURSORS TENDED TO RULE OUT A COOLANT FAILURE IN ONE OR MORE CHANNELS AS THIS WOULD HAVE BEEN SEEN IN THE CONTROL ROOM DATA (AN ASSESSMENT THE SOVIETS SHARE). THIS INCIDENT WAS VIRTUALLY INSTANTANEOUS AND PROBABLY CAUSED BY THE WITHDRAWAL OF THE CONTROL RODS. ROSEN SAID THAT THIS WAS NOT YET 100% CERTAIN BUT SEEMED THE MOST LIKELY EXPLANATION. AGAIN HE SAID THAT THE SOVIETS APPEARED TO SHARE THIS ASSESSMENT.

(C) THERE WERE NO ALARMS OR ABNORMAL MEASUREMENTS BEFORE THE EXPLOSION. EVERYTHING WAS NORMAL.

(D) THE TUNNELLING IS PROBABLY INTO THE SUPPRESSION VAULT. THE INTENTION IS TO PUT ADDITIONAL CONCRETE INTO THE VAULT AND IN THE AREAS AROUND IT PRIMARILY TO PREVENT THE COLLAPSE OF THE REACTOR FLOOR, AND ALSO TO PREVENT A CORE MELT. THE LATTER POSSIBILITY APPEARS TO BE RECEDING. THE SOVIETS HAD BEEN VERY CONCERNED ABOUT THIS AT ONE STAGE AND HAD DISCUSSED IT WITH THE IAEA REPRESENTATIVES DURING THEIR VISIT. THE OTHER MAJOR PROBLEM HAD BEEN A FURTHER CRITICALITY. THE REACTOR CORE WAS SO BIG THAT IT ESSENTIALLY COMPRISED APPROX 20 MODULES - EACH WITH ITS OWN CRITICAL CONFIGURATION. IT WAS BECAUSE OF THIS THAT NITROGEN GAS AND NOT LIQUID WAS USED FOR COOLING AND SUPPRESSION OF BURNING SO AS NOT TO DAMAGE THE CORE FURTHER AND INDUCE A CRITICALITY. THE SOVIETS WERE NOW CONFIDENT THAT THIS WAS NO LONGER AN ANALYTICAL POSSIBILITY.

(E) TEMPERATURES ARE BEING MEASURED BY I.R. AND BY LASER /SPECTROMETRY

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SPECTROMETRY. ROSEN WASN'T FAMILIAR WITH THE LATTER TECHNIQUE. NO DRILLING WAS BEING CARRIED OUT BECAUSE OF THE HIGH HEAT AND RADIOACTIVE LEVELS.

(F) PROBABLY ALL OF THE URANIUM IN THE CORE HAS BEEN MELTED. ROSEN HAD NO FIGURES BUT WITH RECORDED TEMPERATURES OF OVER 5000 DEGREES C IT SEEMED LOGICAL THAT ALL THE URANIUM AND STEEL HAD MELTED. ROSEN HAD NO DETAILS OF THE EXTENT OF THE DAMAGE TO THE GRAPHITE. THE TOTAL EXTENT AND LOCATIONS OF THE FIRES WERE NOT KNOWN.

(G) THE NITROGEN WAS BROUGHT IN.

(H) ROSEN FELT THAT THE FIRE STARTED VERY QUICKLY AFTER THE INITIAL EXPLOSION AND SO TENDED TO BELIEVE THIS WAS THE REASON WHY THE RADIOACTIVE PLUME WENT SO HIGH.

(I) BORON WAS DROPPED BECAUSE OF CRITICALITY CONCERNS (SEE ABOVE).

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PS/LADY YOUNG
PS/MR EGGAR
PS/MRS CHALKER
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MR GOODALL
MR DAUNT
MR RATFORD
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MR RUBERY } HANNIBAL HOUSE.
MR E RIDER } HSE N11, THAMES HSE.STH.
MR S HARBISON }
MR S SEYMOUR, OT3/5C, DTI (VICTORIA ST.)
MR G MEEKINGS } MAFF
MR R HATHAWAY }
MR D LEVEY UKAEA
MR N BURTON BRITISH COUNCIL
MR J DUNSTER NRPB, CHILTON, DIDCOT.
DR E LAWRENCE D1 52, MOD
MISS M LEWIS DELI/MOD
D.NUC.POL.SCI/MOD
MR STEVENS AE DIVISION, D/ENERGY
POD (WELFARE)

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FM UKMIS VIENNA

TO DESKBY 101050Z FCO

TELNO 76

OF 100945Z MAY 86

INFO IMMEDIATE MOSCOW, WARSAW, BUCHAREST, BUDAPEST, PRAGUE, SOFIA,
BELGRADE, BONN, UKDEL OECD, EAST BERLIN, BMG BERLIN, UKREP BRUSSELS,
STOCKHOLM, HELSINKI

INFO PRIORITY WASHINGTON

MY TELNO 75: CHERNOBYL

1. FISHER SPOKE ON 10 MAY TO ROSEN (IAEA DIRECTOR OF NUCLEAR SAFETY). HIS ANSWERS WERE AS FOLLOWS:

(1) (A) POWER LEVELS WHEN REACTOR TRIPPED: TWO ACCOUNTS WERE GIVEN BY THE SOVIETS. BOTH SAY THAT THE REACTOR WAS IN A PLANNED SHUTDOWN AT THE TIME OF THE ACCIDENT. THE CLAIMED SHUTDOWN TIME WAS TWO AND A HALF HOURS WHICH ROSEN THOUGHT UNUSUALLY FAST. HE QUERIED THIS AND WAS TOLD THAT THE REACTOR DID HAVE A RAPID SHUTDOWN CHARACTERISTIC. ONE ACCOUNT SAID THAT THE REACTOR WENT DOWN TO ZERO POWER AND WAS AT THAT LEVEL WHEN THE ACCIDENT OCCURED. THE OTHER, THAT THE REACTOR WENT DOWN TO ZERO POWER AND WAS BEING TAKEN UP TO 200 MEGAW WHEN THE ACCIDENT OCCURRED. ROSEN SAID THAT HE HAD SEEN CONTROL ROOM DATA WHICH SUPPORTED THAT LATTER EXPLANATION. THE DATA ALSO SHOWED THAT THE SHUTDOWN WAS A ROUTINE EVENT AND NOT A CONSEQUENCE OF ANY INCIDENT. THE SHUTDOWN ITSELF WAS UNEVENTFUL UNTIL THE ACCIDENT. ROSEN WAS CONFIDENT THAT THE ACCIDENT ITSELF WAS A SPONTANEOUS EVENT WITHOUT ANY PRECURSORS.

(B) COOLING WAS MAINTAINED UP TO THE OCCURRENCE OF THE MAJOR RELEASE.

(2) THE SOVIETS HAVE CREATED ACCESS TO THE SUPPRESSION POOL UNDER THE REACTOR CORE CONTAINMENT BY TUNNELLING FROM UNIT 3. THEY ARE CURRENTLY DOING A LOT OF WORK IN THIS AREA. ACCORDING TO THE SOVIETS, INFRA RED MEASUREMENTS OF TEMPERATURE SHOW THAT THE CORE IS COOLING DOWN (NO FIGURES GIVEN) AND THAT IT IS SIGNIFICANTLY BELOW THE MELTING POINT OF URANIUM OXIDE. ROSEN FELT THAT THE SOVIETS REALIZED THAT THEIR INFRA RED TEMPERATURE TECHNIQUES IN THIS AREA WERE NOT SENSITIVE ENOUGH TO PICK UP ALL POSSIBLE HOT SPOTS. RADIATION LEVELS IN THIS AREA ARE HIGH BUT THE SOVIETS WOULD NOT GIVE PRECISE FIGURES. ROSEN FELT THE SOVIETS DID NOT WANT TO REVEAL THE HIGH LEVELS THAT THEIR PEOPLE ARE WORKING IN FOR FEAR OF SUBSEQUENT CRITICISM. A CONCRETE MAT IS BEING LAID BENEATH THE REACTOR TO CATCH ANY MELT-THROUGH, ALTHOUGH THE SOVIETS APPEAR CONFIDENT THAT SUCH AN OCCURRENCE IS NOW UNLIKELY.

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(3) COOLING WATERS: THE SOVIETS MAINTAIN THAT COOLING WATER IS NOT A PROBLEM. THE REACTORS ARE DESIGNED TO COOL BY NATURAL CIRCULATION IF THEY HAVE TO. IF REQUIRED WATER CAN BE BROUGHT IN. COOLING OF THE DAMAGED CORE IS BEING ACHIEVED BY USING NITROGEN. LIQUID NITROGEN IS BEING BROUGHT TO THE SITE IN TANKS. PIPES ARE USED TO TAKE THE NITROGEN GAS TO THE CORE. (NOTE: GAS PREFERRED TO LIQUID, AS THE LATTER WOULD QUOTE SHOCK UNQUOTE THE CORE). THE SOVIETS ARE ALSO CONSIDERING USING LIQUID NITROGEN TO FREEZE THE SURROUNDING SUB-SOIL TO HELP PREVENT SEEPAGES OF ACTIVITY. ROSEN DID NOT KNOW IF THIS WAS FEASIBLE BUT WAS IMPRESSED WITH THE IDEA.

(4) POWER IS COMING IN VIA TRANSMISSION LINES. THE PHYSICAL DAMAGE TO THE CHERNOBYL SITE IS APPARENTLY LIMITED TO UNIT 4 AND DOES NOT AFFECT OTHER PARTS.

(5) THE SOVIETS CLAIM THAT ALL CONTROL ROOMS ARE ACCESSIBLE. 3 AND 4 ARE ACCESSIBLE WITH RESPIRATORS ONLY.

(6) THE SMOKE WAS A LIGHT GREY EMISSION. ROSEN FELT THAT IT WAS NOT A RESULT OF ANY RESIDUAL CORE BURNING BUT THE COMBUSTION OF MATERIALS USED TO DROP THE SAND AND BORON (SACKING AND PARACHUTES). A CORE FIRE WOULD BE EXPECTED TO BURN WITH A DENSE BLACK SMOKE. ROSEN HAD SEEN A VIDEO RECORDING TAKEN ON DAY THREE WHICH SHOWED THE CORE TO BE BURNING LIKE A QUOTE STEEL OPE FURNACE UNQUOTE WITH DENSE CLOUDS OF BLACK SMOKE BEING RELEASED.

(7) THE SOVIETS CLAIM TO HAVE DROPPED 4000 TONS OF SAND/LEAD/BORON ONTO THE CORE. FROM ROSEN'S OWN ACTIVITY READINGS TAKEN AS HE FLEW NEAR THE SITE THE EMISSION LEVELS ARE NOW LOW SHOWING THAT THE RADIATION RELEASE TO THE AIR HAS EFFECTIVELY BEEN STOPPED. INFRA RED MEASUREMENTS TAKEN FROM HELICOPTERS AND THE SURFACE SHOW NO HOT SPOTS TO INDICATE THAT THE FIRE IS STILL BURNING.

(2) ROSEN'S ASSESSMENT WAS THAT THE SOVIETS ARE NOW DEALING REASONABLY WELL WITH THE TECHNICAL PROBLEMS THEY ARE FACING AT THE SITE. WHILST THEY STILL DO NOT UNDERSTAND PRECISELY WHAT IS HAPPENING IN THE CORE THEY SEEM WELL AWARE OF THE POSSIBLE PROBLEMS THEY MAY FACE AND ARE WORKING TO COUNTER THEM. THE ENGINEERS HE MET AT CHERNOBYL WERE RESPONSIBLE AND COMPETENT, AS WERE THE OFFICIALS IN MOSCOW. THE CHERNOBYL SITE NOW APPEARED TO BE WELL EQUIPPED FOR DEALING WITH THE ACCIDENT. EQUIPMENT HAD BEEN BROUGHT IN FROM ABROAD AND ROSEN FELT THE SOVIETS WOULD NOT NOW HESITATE TO ASK FOR FURTHER HELP IF THEY REQUIRED IT,

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(3) THE BASIC APPROACH WAS ASSESSED AS REASONABLE. ROSEN POINTED OUT THAT TRYING TOO MANY IDEAS AT ONCE COULD BE COUNTER-PRODUCTIVE.

(4) OVERALL THE SITUATION DID APPEAR TO BE STABILIZING, TEMPERATURES WERE DECREASING AND RADIATION HAD BEEN CONTAINED. CONTINUED COOLING OF THE CORE WAS OBVIOUSLY ESSENTIAL, BUT THE SOVIETS APPEARED CONFIDENT THAT THEY HAD THIS UNDER CONTROL. THEY WERE ALSO CONFIDENT THAT THE OTHER UNITS WERE NOT UNDER THREAT. ROSEN SAID THAT HE PERSONALLY FELT THIS TO BE CORRECT BUT COULD NOT CATEGORICALLY SAY THAT FURTHER PROBLEMS COULD NOT DEVELOP.

(5) KIEV: ROSEN FELT THAT THE SOVIETS COULD STILL HAVE A PROBLEM AT KIEV. THE OFFICIALS WERE DELIBERATELY TRYING TO PREVENT PANIC IN THE CITY BY WITHHOLDING INFORMATION. IF THE RISK TO LIFE INCREASED TO DANGEROUS LEVELS THE CITY WOULD BE EVACUATED, BUT FOR THE PRESENT THIS WAS REGARDED AS NOT BEING NECESSARY. NO INFORMATION ON RADIATION LEVELS AT KIEV WAS GIVEN TO THE IAEA.

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