

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
Houston, Texas
77058



MAR 10 1993

Reply to Attn of:

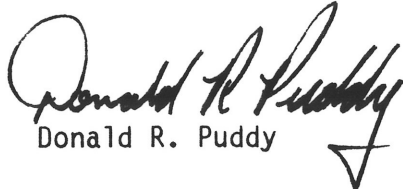
CB-93-063

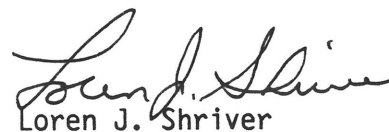
TO: NASA Headquarters
Attn: M-3/Deputy Associate Administrator, Russian Programs

FROM: AR/JSC Special Assistant for Joint U.S./Russian Federation
Program
CB/Deputy Chief, Astronaut Office

SUBJECT: ROM Costs for Cosmonaut Training for SLM-1

Enclosed is a summary of the requirements and ROM costs for training for cosmonauts to support SLM-1. This summary covers the cosmonauts who will launch on Soyuz but return after their MIR mission on STS-71, and those cosmonauts launched with STS-71 to replace the MIR crew. This summary does not cover the costs of performing medical research on the returning cosmonauts at JSC, or any preflight training for medical operations on orbit. The requirements outlined here will form the basis of negotiations and agreements, planned for April 5-9, 1993, with the Russian agencies on crew exchange and training.


Donald R. Puddy


Loren J. Shriver

Enclosure

cc:
CA/D. C. Leestma
CB/R. L. Gibson
GA/T. W. Holloway
SA/C. L. Huntoon



NASA
Lyndon B. Johnson Space Center

**ASTRONAUT
OFFICE**

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

MARCH 4, 1993

LOREN J. SHRIVER



NASA
Lyndon B. Johnson Space Center

ASTRONAUT
OFFICE

SUBJECT:

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

NAME:

LOREN J. SHRIVER

DATE:

3/4/93

PAGE

1

CONTENTS

- ASSUMPTIONS
- GENERAL COSTS
- TRAINING HOURS/COST SUMMARY
- ITEMIZATION: FACILITY/HOURS/COST
- REQUIREMENTS LISTING (ENCLOSURE)
- TOTAL COST SUMMARY



NASA
Lyndon B. Johnson Space Center

**ASTRONAUT
OFFICE**

SUBJECT:

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

NAME:

LOREN J. SHRIVER

DATE:

3/4/93

PAGE

2

- GENERAL ASSUMPTIONS FOR COST AND TRAINING ESTIMATES

- ALL COSTS ONCE IN THE U.S. PAID BY NASA (SAME AS STS-60 ARRANGEMENT)
 - NO FAMILIES
 - COVERS COSMONAUTS LAUNCHED AND RETURNED ON STS-71, SLM-1
 - COVERS ALL TRANSPORTATION COSTS, LODGING, PER DIEM, EMERGENCY HEALTH CARE, AND SOME LANGUAGE TRAINING
- BACKUP CREW TRAINING COSTS ARE INCLUDED
- CREW MEMBERS ARE PREVIOUSLY FLOWN (EXPERIENCED)
- IDEAL TIMING FOR THE TRAINING
 - AS CLOSE AS POSSIBLE TO SOYUZ-TM/MIR MISSION LAUNCH
 - SLM-1 ASCENT CREW IMMEDIATELY PRIOR TO STS-71 LAUNCH (6 WEEKS)
- ASSUME THE BACKUP ASTRONAUT FOR SOYUZ/MIR MISSION WILL FLY ON STS-71
 - PROVIDES AT LEAST ONE U.S. CREW MEMBER WHO CAN SPEAK RUSSIAN
 - CAN ASSIST WITH THE TRAINING FLOW FOR COSMONAUTS LAUNCHING WITH STS-71
 - CAN HELP ASSURE COSMONAUTS UNDERSTAND EMERGENCY PROCEDURES/ACTIONS
- ENCOURAGE COSMONAUTS TO ACQUIRE ENGLISH LANGUAGE SKILLS BEFORE JSC TRAINING
 - ASSUME TRANSLATION/INTERPRETATION STILL REQUIRED FOR MOST TRAINING
- THESE COSTS DO NOT INCLUDE ANY PAYLOAD/SCIENCE/MEDICAL DSO TRAINING
- BASICALLY, THE PLAN PROVIDES A TRAINED PASSENGER FOR LAUNCH OR ENTRY
- SLM-1 NASA CREW WILL NEED TO PROVIDE SIGNIFICANT REFRESHER TRAINING ON ORBIT (GALLEY, WCS, STOWAGE, HABITATION, ENTRY PROCEDURES, ETC.)



NASA
Lyndon B. Johnson Space Center

**ASTRONAUT
OFFICE**

SUBJECT:

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

NAME:

LOREN J. SHRIVER

DATE:

3/4/93

PAGE

3

• GENERAL COSTS

- RETURN CREW FROM MIR MISSION (4 COSMONAUTS/2 WEEKS)

AIRLINE FARES (ROUNDTRIP, MOSCOW-HOUSTON)	(4 X 1650.00)	6600.00
INITIAL ARRIVAL ALLOWANCE	(4 X 300.00)	1200.00
RENTAL CARS/TAXI	(4 X 40 X 14)	2240.00
LODGING	(4 X 100 X 14)	5600.00
PER DIEM	(4 X 34 X 14)	1904.00
ENGLISH TRAINING (IN RUSSIA)	(2 X 900)	1800.00
INTERPRETERS	(30 X 45)	1350.00
EMERGENCY HEALTH CARE	(4 X 2000)	<u>8000.00</u>
		28694.00 - \$28.7 K

- EXCHANGE CREW ON SLM-1 LAUNCH (4 COSMONAUTS/6 WEEKS)

AIRLINE FARES (ROUNDTRIP, MOSCOW-HOUSTON)	(4 X 1650.00)	6600.00
INITIAL ARRIVAL ALLOWANCE	(4 X 300.00)	1200.00
RENTAL CARS/TAXI	(4 X 40 X 42)	6720.00
LODGING	(4 X 100 X 42)	16800.00
PER DIEM	(4 X 34 X 42)	5712.00
ENGLISH TRAINING (IN RUSSIA)	(2 X 900)	1800.00
INTERPRETERS	(80 X 45)	3600.00
EMERGENCY HEALTH CARE	(4 X 2000)	<u>8000.00</u>
		50432.00 - \$50.4 K



NASA
Lyndon B. Johnson Space Center

ASTRONAUT
OFFICE

SUBJECT:

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

NAME:

LOREN J. SHRIVER

DATE:

3/4/93

PAGE

4

• OTHER GENERAL TRAINING REQUIREMENTS

- LITHOS (?)	\$5000.00
- TCDT COSTS	
- COMMERCIAL AIR (R/T HOUSTON-ORLANDO) (4 X 344)	1376.00
- CREW QUARTERS (4 X 4 X 50.00)	800.00
- LAUNCH COSTS	
- TRANSPORTATION	GOVERNMENT
- CREW QUARTERS (2 X 4 X 50.00)	<u>400.00</u>
	\$7576.00 - \$7.6 K

• OTHER TRAINING TIME (COSTS UNKNOWN)

- KSC BADGING/ACCESS REQUIREMENTS (VIDEOS)	5.25 HOUR
- ADMIN TIME	8 HOUR
- TIME FOR PR	2 HR/WEEK

SL-M: RUSSIAN CREW EXCHANGE TRAINING COST

MARCH 1993

DG6/T. E. CAPPS
DG6/D. E. LONG

TRAINING HOURS / COST SUMMARY

- RUSSIAN COSMONAUTS ON SHUTTLE TO MIR NEED 117 HOURS TRAINING EACH (WITHIN 6 WEEKS OF LAUNCH) AT ESTIMATED COST OF \$106,322
- RUSSIAN COSMONAUTS RETURNING ON SHUTTLE FROM MIR NEED 54 HOURS OF TRAINING EACH (WITHIN 3 MONTHS OF SOYUZ LAUNCH) AT ESTIMATED COST OF \$31,583
- EXPERIENCED U.S. ASTRONAUT RETURNING ON SHUTTLE FROM MIR REQUIRES MINIMAL REFRESHER TRAINING

ITEMIZATION: FACILITY / HOURS / COST PER COSMONAUT

● COSMONAUT ON SHUTTLE (TO MIR)

<u>FACILITY</u>	<u>HOURS</u>	<u>COST</u>
WORKBOOK	12	120
CLASSROOM	16	1,200
SMS	16	70,912
CCT	34	19,040
FFT	8	4,480
WETF	3	9,300
WCS	2	150
KSC (TCDC)	20	TBD
SUIT LAB	<u>2</u>	<u>1,120</u>
TOTALS	113	106,322

● COSMONAUT ON SHUTTLE (FROM MIR)

<u>FACILITY</u>	<u>HOURS</u>	<u>COST</u>
WORKBOOK	15	150
CLASSROOM	10	750
SMS	4	17,728
CCT	15	8,400
FFT	7	3,360
WCS	1	75
SUIT LAB	<u>2</u>	<u>1,120</u>
TOTALS	54	31,583

MIR DOCKING MISSION: TRAINING FOR COSMONAUTS ON SHUTTLE TO MIR		
<u>COURSE</u>	<u>LESSON TITLE</u>	<u>MIR PLANNED HOURS</u>
CREW SYSTEMS	CREW STATION LOCATION CODING (WORKBOOK)	2
	ORBIT LIGHTING (WORKBOOK)	2
	MEDICAL EQUIPMENT (WORKBOOK)	2
	WASTE COLLECTION SYSTEM (WORKBOOK)	2
	CREW CABIN FAMILIARIZATION	1
	INGRESS EGRESS (WORKBOOK)	2
	BAILOUT SYSTEMS (WORKBOOK)	2
	FOOD SYSTEMS AND DINING (WORKBOOK)	2
	ESCAPE SYSTEMS INTRODUCTION BRIEFING	3
	WASTE COLLECTION SYSTEMS (BRIEFING)	1
	GALLEY FOOD PREPARATION	1
	BAILOUT SYSTEM PROCEDURES	3
	WASTE COLLECTION SYSTEMS PROCEDURES	1
	AUDIO (HANDS ON TRAINING)	3
	HABITABILITY EQUIPMENT AND PROCEDURES	3
	POST LANDING EGRESS PROCEDURES PRACTICE	4
	POST INSERTION/DEORBIT PREPARATION TIMELINE	6
	FLIGHT COMMUNICATIONS PLAN	2
	WATER SURVIVAL BRIEFING	2
	BAILOUT SYSTEM (HANDS ON TRAINING IN WATER)	3
	ASCENT, CREW ACTIVITY PLAN, DESCENT TIMELINE WALK THROUGH	8
	PRELAUNCH INGRESS/EGRESS PROCEDURES TRAINING	4
	WASTE COLLECTION SYSTEM PROCEDURES REFRESHER	0.5
	STOWAGE REVIEW	3
Sub Total		62.5

**MIR DOCKING MISSION:
TRAINING FOR COSMONAUTS ON SHUTTLE TO MIR (Continued)**

<u>COURSE</u>	<u>ACTIVITY TITLE</u>	<u>PLANNED HOURS</u>
ASCENT FLIGHT OPERATIONS	ASCENT MISSION BRIEFING	1
	ASCENT SKILLS (SHUTTLE MISSION SIMULATOR, SMS)	<u>4</u>
	Sub Total	5
SPACELAB SYSTEMS	SPACELAB MODULE FAMILIARIZATION WALK THROUGH	1
	SPACELAB SYSTEMS FAMILIARIZATION	<u>2</u>
	Sub Total	3
ON ORBIT FLIGHT OPERATIONS	ADVANCED ORBIT SKILLS, SMS	4
	POST INSERTION OPERATIONS, SMS	<u>4</u>
	Sub Total	8
ENTRY FLIGHT OPERATIONS	ENTRY SKILLS, SMS	<u>4</u>
	Sub Total	4
	Training Sub Total	82.5
FLIGHT SUPPORT (NON-TRAINING MISSION PREPARATION ACTIVITIES)	LAUNCH ESCAPE SUIT FITTING	2
	FLIGHT CLOTHING FITTING	1
	BENCH STOWAGE REVIEW	3
	TCDT	20
	FLIGHT CLOTHING	2
	FINAL FITTING AND REVIEW	2
	L-10 DAY PHYSICAL	<u>4</u>
	Sub Total	<u>34</u>
	Grand Total	116.5

**MIR DOCKING MISSION: TRAINING FOR
US ASTRONAUT & RUSSIAN COSMONAUTS RETURN ON SHUTTLE
(Continued)**

<u>COURSE</u>	<u>LESSON TITLE</u>	<u>PLANNED HOURS</u>
ENTRY FLIGHT OPERATIONS	ENTRY SKILLS, SMS	<u>4</u>
	Sub Total	<u>4</u>
	Training Sub Total	
FLIGHT SUPPORT	LAUNCH ESCAPE SUIT FITTING	2
(NON- TRAINING	FLIGHT CLOTHING FITTING	1
MISSION PREPARATION	FINAL CLOTHING REVIEW AND FITTING	<u>2</u>
ACTIVITIES)	Sub Total	<u>5</u>
	Grand Total	54

NASA

Lyndon B. Johnson Space Center

ASTRONAUT
OFFICE

SUBJECT:

ROM COSTS FOR SLM-1 MISSION
COSMONAUT TRAINING SUPPORT

NAME:

LOREN J. SHRIVER

DATE:

3/4/93

PAGE

12

• TOTAL COST SUMMARY

- GENERAL COSTS

- RETURN CREW FROM MIR	\$28.7 K
- EXCHANGE CREW TO MIR	\$50.4 K
- MISCELLANEOUS	<u>\$7.6 K</u>
	\$86.7 K

- TRAINING/FACILITIES COSTS (PRIME & BACKUP CREWS)

- RETURN CREW FROM MIR (2 WEEKS)	\$65.1 K
- EXCHANGE CREW TO MIR (6 WEEKS)	<u>\$204.8 K</u>
	\$269.9 K

- TOTAL	\$86.7 K
	<u>\$269.9 K</u>
	\$356.6 K