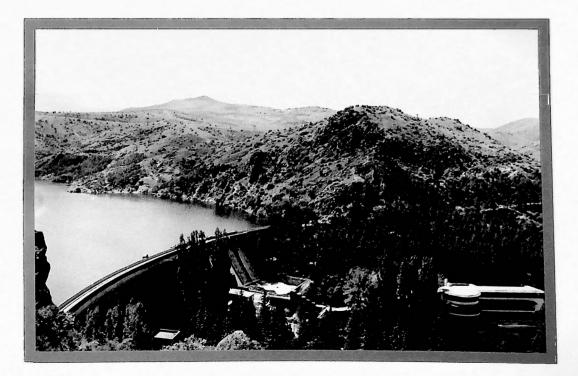
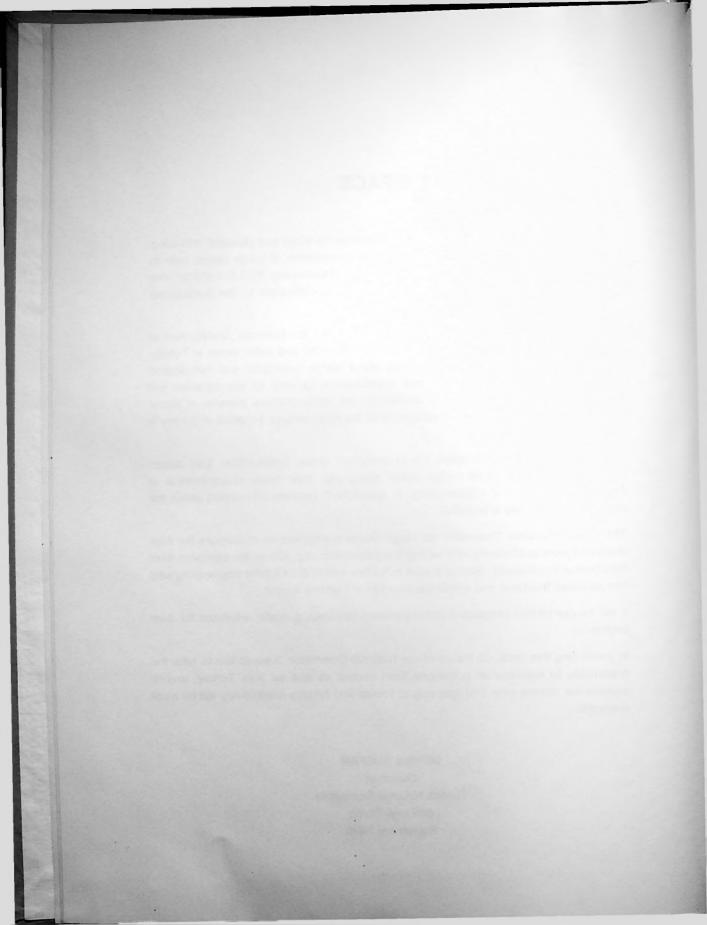


TURKISH NATIONAL COMMITTEE ON LARGE DAMS TRCOLD

DAM ENGINEERING IN TURKEY



ANKARA 1999



TRCOLD



LIST OF CONTENTS

PREFACE			
1 HISTORICAL DEVELOPMENT OF DAMS IN ANATOLIA	3		
2 WATER RESOURCES OF TURKEY	9		
3 WATER SECTOR IN TURKEY	15		
3.1 Background and Organization of Hydraulic Works	15		
3.2 General Directorate of State Hydraulic Works (DSİ)	15		
3.3 General Directorate of Electrical Power Resources Survey and Development Administration (EİE)	17		
3.4 Other Organizations	18		
4 DAMS CONSTRUCTED IN TURKEY	21		
4.1 General Description of Dams	21		
4.2 Geology of Dam Sites and Encountered Problems	28		
4.2.1 General Geology of Turkey	28		
4.2.2 Geological Problems of Some Large Dams in Turkey	30		
4.3 Hydrological Studies	37		
4.3.1 Hydrological Studies in Planning and Design Stages	37		
4.3.2 Operation Stage Hydrological Studies	38		
4.4 Studies for Investigation, Development and Quality Control	39		
4.4.1 Hydraulic Model Tests	39		
4.4.2 Tests on Concrete Materials	40		

i

1999

TRCOLD



	P	age No.
4.4.3	3 Soil Mechanics Tests	40
4.4.4	Chemical Analysis and Quality Control Studies	40
4.4.5	i Isotopic Tests	40
4.5	Operation and Maintenance	40
4.6	Studies on Expropriations and Settlements and Encountered Problems	41
4.6.1	Expropriations	41
4.6.2	Resettlement	41
4.7	Environmental Impacts of Dams	45
5 I	DEVELOPMENT OF HYDROELECTRIC POTENTIAL IN TURKEY	53
6 (CONCLUSIONS	61

APENDICES

APPENDIX 1: Dams and HEPP in Operation

APPENDIX 2: Dams and HEPP Under Construction

APPENDIX 3: Dams and HEPP Final Design Completed

APPENDIX 4: Dams and HEPP Under Final Design

APPENDIX 5: Run-off River and Canal Hydroplants

APPENDIX 6: Major Dams of Turkey

APPENDIX 7: Information about Companies Supporting TRCOLD Activities

TRCOLD



LIST OF TABLES .

	Page	No.
TABLE 1	: MAIN CHARACTERISTICS OF OTTOMAN PERIOD DYKES	5
TABLE 2	: HYDROELECTRIC ENERGY POTENTIAL OF TURKEY AND ITS	
	DEVELOPMENT AT THE BEGINNING OF YEAR 1999	54
TABLE 3	: HYDROELECTRIC POWER PLANTS IN OPERATION AT THE	
	BEGINNING OF 1999 WITH INSTALLED CAPACITIES	
	GREATER THAN 500 MW	55
TABLE 4	: CLASSIFICATION OF HYDROELECTRIC POWER PLANTS TO	
	BE CONSTRFUCTED IN FUTURE ACCORDING TO INSTALLED	
	CAPACITIES	57

LIST OF FIGURES

		Page	No.
FIGURE 1	:	WATER RESOURCES OF TURKEY	10
FIGURE 2	:	ANNUAL WATER POTENTIAL (SURFACE FLOW) OF	
		HYDROLOGIC BASINS IN TURKEY	11
FIGURE 3	:	NUMBER OF DAMS CONSTRUCTED VERSUS CALENDAR	
		YEARS	22
FIGURE 4	:	RESERVOIR CAPACITIES OF DAMS VERSUS CALENDAR	
		YEARS	22
FIGURE 5	:	FILL VOLUMES (EARTH+ROCKFILL) OF DAMS VERSUS	
		CALENDAR YEARS	23
FIGURE 6	:	CONCRETE VOLUMES OF DAMS VERSUS CALENDAR YEARS	23
FIGURE 7	:	DAMS AND HYDROELECTRIC POWER PLANTS IN TURKEY	24
FIGURE 8a	:	DISTRIBUTION OF DAMS IN TURKEY ACCORDING TO THEIR	
		TYPES	25
FIGURE 8b	:	DISTRIBUTION OF DAMS IN TURKEY ACCORDING TO	
		THEIR HEIGHTS	26
FIGURE 9	:	DEVELOPMENT OF INSTALLED CAPACITY IN TURKEY	
		BETWEEN YEARS 1950 – 1997	54
FIGURE 10	:	HYDROELECTRIC POWER PLANTS IN TURKEY WITH	
		INSTALLED CAPACITIES GREATER THAN 250 MW	56