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ภาคผนวก

ก. โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม RAINFALL

ข. นโยบายดำเนินการอ่างเก็บน้ำเอนกประสงค์ของการไฟฟ้าฝ่ายผลิต

ค. การคำนวณปริมาณการใช้น้ำของพืชจากข้อมูลภูมิอากาศ

ง. โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม IDMO1

จ. โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม STRON

ภาคผนวก ก

โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม RAINFALL

ก. โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม RAINFALL

ก.1 AVERAGE MONTHLY RAINFALL

THE PROGRAM COMPUTE AVERAGE MONTHLY RAINFALL OF THE AREA FROM VARIOUS RAIN GAGE STATIONS CAN PROCESS UP TO 50 YEARS OF DATA AND UP TO 100 RAIN GAGE STATIONS FOR EACH AREA, MANY AREA AS REQUIRED. THE PROGRAM REQUIRED 5,103 WORDS OF CORE MEMORY ON UNIVAC 1106 SYSTEM. THE IBM 1130 VERSION USED DOS OVERLAYS TO FIT 8K WORDS.

ก.1.1 PROGRAM LISTING

```
C      PROGRAM TO COMPUTE AVERAGE MONTHLY RAINFALL FROM VARIOUS STATIONS
C      PROGRAMMER * SUPOT PROMNARET * AUGUST 1977
C
       INTEGER CNT(50,12)
       DIMENSION COD(2),SCD(100,2),SNAME(18),RFL(50,12),SUM(50,12)
      1,          DUMMY(12),AVR(12),RMONT(12),ANAME(6)
       DATA RMONT/' APR',' MAY',' JUN',' JUL',' AUG',' SEP',' OCT',' NOV'
      1,' DEC',' JAN',' FEB',' MAR'/
       DATA MP,MX,MY/1,6,5/
C
C      READ AREA CODE, BEGINNING YEAR, ENDING YEAR, NUMBER OF RAIN GAGE
C      STATION, PUNCH OUTPUT OPTION AND AREA NAME
C
  100  READ(MY,110,END=900)COD,IBGN,IEND,NS,NPUNC,ANAME
  110  FORMAT(8X,A4,A2,2(4X,I2),I6,12X,I6,6X,6A4)
       NY=IEND-IBGN+1
C
       DO 150 J=1,12
       DO 150 I=1,NY
       SUM(I,J)=0.
  150  CNT(I,J)=0.
C
       DO 500 N=1,NS
C
       DO 210 J=1,12
       DO 210 I=1,NY
  210  RFL(I,J)=-9999.
C
C      READ STATION NAME
C
       READ(MY,220,END=900)(SCD(N,I),I=1,2),SNAME
  220  FORMAT(A4,A2,2X,18A4)
C
C      READ MONTHLY RAINFALL DATA
C
  230  READ(MY,240,END=900)IYEAR,DUMMY
  240  FORMAT(6X,I2,12F6.0)
       IF(IYEAR.EQ.0) GO TO 300
       K=IYEAR-IBGN+1
       IF(K.LT.1.OR.K.GT.NY) GO TO 230
       DO 250 J=1,12
       IF(DUMMY(J).LT.0) DUMMY(J)=-9999.
  250  RFL(K,J)=DUMMY(J)
       GO TO 230
C
C      COMPUTE MONTHLY AVERAGE
C
  300  DO 320 J=1,12
       AVR(J)=0.
       DUMMY(J)=0.
       DO 320 I=1,NY
       IF(RFL(I,J).LT.0.) GO TO 320
       IF(RFL(I,J).EQ.0.) GO TO 310
       SUM(I,J)=SUM(I,J)+RFL(I,J)
       AVR(J)=AVR(J)+RFL(I,J)
  310  CNT(I,J)=CNT(I,J)+1
       DUMMY(J)=DUMMY(J)+1.
  320  CONTINUE
C
       ANL=0.
       DO 330 J=1,12
       AVR(J)=AVR(J)/DUMMY(J)
       AVR(J)=IFIX((AVR(J)+0.05)*10.)/10.
       ANL=ANL+AVR(J)
  330  CONTINUE
       ANL=IFIX((ANL+0.05)*10.)/10.
```

หมายเหตุ จากโปรแกรมสำเร็จรูป ของศูนย์คอมพิวเตอร์ กรมชลประทาน

```
C
C     PRINT MONTHLY RAINFALL OF THE STATION
C
      WRITE(MX,340)SNAME,ANAME
  340 FORMAT('1ROYAL IRRIGATION DEPARTMENT, THAILAND'
     1,T107,'COMPUTER CENTER',/,' STATION = ',18A4
     2,T107,'RAINFALL - 2.06',/,' AREA    = ',6A4
     3,     //,45X,'MONTHLY RAINFALL IN MILLIMETER')
      WRITE(MX,350)RMONT
  350 FORMAT(/,' WATER YEAR',3X,12(4X,A4),5X,'ANNUAL')
      WRITE(MX,360)
  360 FORMAT(/,1X,120('-'),/)
C
      IBG=IBGN+1899
      DO 380 I=1,NY
      IYEAR=IBG+I
      TOT=0.
C
      DO 370 J=1,12
      IF(RFL(I,J).LT.0.) TOT=-9999.
      IF(RFL(I,J).LT.0.) GO TO 380
  370 TOT=TOT+RFL(I,J)
      TOT=IFIX((TOT+0.05)*10.)/10.
  380 WRITE(MX,390)IYEAR,(RFL(I,J),J=1,12),TOT
  390 FORMAT(I11,3X,12(2X,F6.1),5X,F6.1)
C
      WRITE(MX,360)
      WRITE(MX,400)AVR,ANL
  400 FORMAT('     AVERAGE',3X,12(2X,F6.1),5X,F6.1)
  500 CONTINUE
C
C     COMPUTE AVERAGE MONTHLY RAINFALL
C
      DO 510 J=1,12
      AVR(J)=0.
      DO 510 I=1,NY
      SUM(I,J)=SUM(I,J)/FLOAT(CNT(I,J))
  510 AVR(J)=AVR(J)+SUM(I,J)
C
      ANL=0.
      DO 520 J=1,12
      AVR(J)=AVR(J)/FLOAT(NY)
      AVR(J)=IFIX((AVR(J)+0.05)*10.)/10.
      ANL=ANL+AVR(J)
  520 CONTINUE
      ANL=IFIX((ANL+0.05)*10.)/10.
C
C     PRINT AVERAGE MONTHLY RAINFALL
C
      WRITE(MX,540)ANAME
  540 FORMAT('1ROYAL IRRIGATION DEPARTMENT, THAILAND'
     1,T107,'COMPUTER CENTER',/,' AREA = ',6A4,  ' USING THE FOLLOWING
     2 RAIN GAGE STATIONS',T107,'RAINFALL - 3.01')
      WRITE(MX,550)((SCD(N,I),I=1,2),N=1,NS)
  550 FORMAT(1X,20(A4,A2))
      WRITE(MX,566)
  566 FORMAT(/,41X,'AVERAGE MONTHLY RAINFALL IN MILLIMETER')
      WRITE(MX,350)RMONT
      WRITE(MX,360)
C
      DO 580 I=1,NY
      IYEAR=IBG+I
      TOT=0.
      DO 570 J=1,12
      SUM(I,J)=IFIX((SUM(I,J)+0.05)*10.)/10.
      TOT=TOT+SUM(I,J)
  570 CONTINUE
C
      TOT=IFIX((TOT+0.05)*10.)/10.
  580 WRITE(MX,390)IYEAR,(SUM(I,J),J=1,12),TOT
      WRITE(MX,360)
C
      WRITE(MX,400)AVR,ANL
C
C     PUNCH AVERAGE MONTHLY RAINFALL
C
```

```
      IF(NPUNC.EQ.0) GO TO 800
      WRITE(MX,540)ANAME
      WRITE(MX,550)((SCD(N,I),I=1,2),N=1,NS)
      WRITE(MX,590)
      IBG=IBGN-1
C
      DO 600 I=1,NY
      IYEAR=IBG+I
      WRITE(MX,590)COD,IYEAR,(SUM(I,J),J=1,12)
  590 FORMAT(1X,A4,A2,I2,I2F6.1)
  600 WRITE(MP,610)COD,IYEAR,(SUM(I,J),J=1,12)
  610 FORMAT(A4,A2,I2,12F6.1)
C
C     BRANCH TO NEXT AREA
C
  800 GO TO 100
C
  900 CALL EXIT
      END
```

n.1.2 INPUT DATA STREAM

```
      MONTH-01 RECORD OF THE FIRST AREA
      MONTHLY RAINFALL DATA OF THE FIRST STATION
      MONTHLY RAINFALL DATA OF THE NEXT STATION
      ..........................................
      MONTHLY RAINFALL DATA OF THE LAST STATION
      MONTH-01 RECORD OF THE NEXT AREA
      MONTHLY RAINFALL DATA OF ALL STATIONS FOR THE AREA
      ..................................................
      MONTH-01 RECORD OF THE LAST AREA
      MONTHLY RAINFALL DATA OF ALL STATIONS FOR THE AREA
```

NOTE THE MONTHLY RAINFALL DATA CAN ENTER TO THE PROGRAM ANY PERIOD OF YEARS, ONLY THE YEARS THAT ARE IN THE PERIOD OF MONTH-01 DATA ARE SELECTED INTO THE CALCULATION. THE MONTHLY RAINFALL DATA OF YEARS IN THE PERIOD OF MONTH-01 DATA WHICH ARE NOT ENTERED ARE CREATED TO MISSING VALUE (-9999.).

n.2 WEIGHTED MONTHLY RAINFALL (DISCARD MISSING DATA)

THE PROGRAM COMPUTE WEIGHTED MONTHLY RAINFALL OF THE AREA FROM VARIOUS RAIN GAGE STATIONS CAN PROCESS UP TO 50 YEARS OF DATA AND UP TO 100 RAIN GAGE STATIONS FOR EACH AREA, MANY AREA AS REQUIRED. IN THIS VERSION IF THE MONTHLY RAINFALL DATA IS THE MISSING VALUE (-99.9) THE MONTHLY DATA IS NOT USED TO COMPUTE WEIGHTED RAINFALL. IN THIS CASE WEIGHTED RAINFALL IS THE SUM OF THE WEIGHTED RAINFALL DIVIDE BY THE SUM OF THE WEIGHTED FACTOR OF THE NO MISSING DATA. THE PROGRAM REQUIRED 5,323 WORDS OF CORE MEMORY ON UNIVAC 1106 SYSTEM. THE IBM 1130 VERSION USED TWO LEVEL STORAGE VIRTUAL MEMORY SYSTEM TO FIT 8K WORDS.

n.2.1 PROGRAM LISTING

```
C     PROGRAM TO COMPUTE WEIGHTED MONTHLY RAINFALL FROM VARIOUS STATIONS
C     THIS VERSION DISCARD MISSING DATA
C     PROGRAMMER * SUPOT PROMNARET * DECEMBER 1978
C
      DIMENSION COD(2),SCD(100,2),SNAME(18),RFL(50,12),SUM(50,12)
     1,         DUMMY(12),AVR(12),RMONT(12),ANAME(6),CODE(2),WRF(100)
     2,         ACF(50,12)
      DATA RMONT/' APR',' MAY',' JUN',' JUL',' AUG',' SEP',' OCT',' NOV'
     1,' DEC',' JAN',' FEB',' MAR'/
      DATA MP,MX,MY/1,6,5/
C
C     READ AREA CODE, BEGINNING YEAR, ENDING YEAR, NUMBER OF RAIN GAGE
C     STATION, PUNCH OUTPUT OPTION AND AREA NAME
C
  100 READ(MY,110,END=900)COD,IBGN,IEND,NS,NPUNC,ANAME
  110 FORMAT(8X,A4,A2,2(4X,I2),I6,12X,I6,6X,6A4)
      NY=IEND-IBGN+1
```

```
C
      DO 150 J=1,12
      DO 150 I=1,NY
      ACF(I,J)=0.
  150 SUM(I,J)=0.
C
      DO 500 N=1,NS
      DO 210 J=1,12
      DO 210 I=1,NY
  210 RFL(I,J)=-9999.
C
C     READ THEISSEN FACTOR
C
      READ(MY,215)CODE,FAC
  215 FORMAT(T33,A4,A2,F6.0)
      WRF(N)=FAC
C
C     READ STATION NAME
C
      READ(MY,220,END=900)(SCD(N,I),I=1,2),SNAME
  220 FORMAT(A4,A2,2X,18A4)
      DO 225 I=1,2
      IF(CODE(I).NE.SCD(N,I)) GO TO 850
  225 CONTINUE
C
C     READ MONTHLY RAINFALL DATA
C
  230 READ(MY,240,END=900)IYEAR,DUMMY
  240 FORMAT(6X,I2,12F6.0)
      IF(IYEAR.EQ.0) GO TO 300
      K=IYEAR-IBGN+1
      IF(K.LT.1.OR.K.GT.NY) GO TO 230
      DO 250 J=1,12
      IF(DUMMY(J).LT.0) DUMMY(J)=-9999.
  250 RFL(K,J)=DUMMY(J)
      GO TO 230
C
C     COMPUTE MONTHLY AVERAGE
C
  300 DO 320 J=1,12
      AVR(J)=0.
      DUMMY(J)=0.
      DO 320 I=1,NY
      IF(RFL(I,J).LT.0.) GO TO 320
      IF(RFL(I,J).EQ.0.) GO TO 310
      AVR(J)=AVR(J)+RFL(I,J)
  310 DUMMY(J)=DUMMY(J)+1.
  320 CONTINUE
C
      ANL=0.
      DO 330 J=1,12
      AVR(J)=AVR(J)/DUMMY(J)
      AVR(J)=IFIX((AVR(J)+0.05)*10.)/10.
      ANL=ANL+AVR(J)
  330 CONTINUE
      ANL=IFIX((ANL+0.05)*10.)/10.
C
C     PRINT MONTHLY RAINFALL OF THE STATION
C
      WRITE(MX,340)SNAME,ANAME,FAC
  340 FORMAT('1ROYAL IRRIGATION DEPARTMENT, THAILAND'
     1,T107,'COMPUTER CENTER',/,' STATION - ',18A4,T107,'RAINFALL - 2.06
     2',7,' AREA    - ',6A4,' THEISSEN FACTOR ',F7.5
     3,      //,45X,'MONTHLY RAINFALL IN MILLIMETER')
      WRITE(MX,350)RMONT
  350 FORMAT(/,' WATER YEAR',3X,12(4X,A4),5X,'ANNUAL')
      WRITE(MX,360)
  360 FORMAT(/,1X,120('-'),/)
```

```
C
      IBG=IBGN+1899
      DO 380 I=1,NY
      IYEAR=IBG+I
C
      TOT=0.
      DO 370 J=1,12
      IF(RFL(I,J).LT.0.) TOT=-9999.
C     IF(RFL(I,J).LT.0) SUM(I,J)=SUM(I,J)+AVR(J)*FAC
      IF(RFL(I,J).LT.0.) GO TO 370
      SUM(I,J)=SUM(I,J)+RFL(I,J)*FAC
      ACF(I,J)=ACF(I,J)+FAC
  370 TOT=TOT+RFL(I,J)
      TOT=IFIX((TOT+0.05)*10.)/10.
  380 WRITE(MX,390)IYEAR,(RFL(I,J),J=1,12),TOT
  390 FORMAT(I11,3X,12(2X,F6.1),5X,F6.1)
C
      WRITE(MX,360)
      WRITE(MX,400)AVR,ANL
  400 FORMAT(  '    AVERAGE',3X,12(2X,F6.1),5X,F6.1)
  500 CONTINUE
C
C     COMPUTE AVERAGE MONTHLY RAINFALL
C
      DO 510 J=1,12
      AVR(J)=0.
      DUMMY(J)=0.
      DO 510 I=1,NY
      IF(ACF(I,J).EQ.0.) SUM(I,J)=-9999.
      IF(ACF(I,J).EQ.0.) GO TO 510
      SUM(I,J)=SUM(I,J)/ACF(I,J)
      DUMMY(J)=DUMMY(J)+1.
      AVR(J)=AVR(J)+SUM(I,J)
  510 CONTINUE
C
      ANL=0.
      DO 520 J=1,12
      AVR(J)=AVR(J)/DUMMY(J)
C     AVR(J)=AVR(J)/FLOAT(NY)
      AVR(J)=IFIX((AVR(J)+0.05)*10.)/10.
      ANL=ANL+AVR(J)
  520 CONTINUE
      ANL=IFIX((ANL+0.05)*10.)/10.
C
C     PRINT WEIGHTED MONTHLY RAINFALL
C
      WRITE(MX,540)ANAME
  540 FORMAT('1ROYAL IRRIGATION DEPARTMENT, THAILAND'
     1,T107,'COMPUTER CENTER',/,' AREA = ',6A4,     ' USING THE FOLLOWING
     2 RAIN GAGE STATIONS',T107,'RAINFALL - 3.03')
      WRITE(MX,550) ((SCD(N,I),I=1,2),WRF(N) ,N=1,NS)
  550 FORMAT(8(2X,A4,A1,'=',F7.5))
      S=0.
      DO 560 N=1,NS
  560 S=S+WRF(N)
      WRITE(MX,565)S
  565 FORMAT(' SUM OF THEISSEN FACTOR =',F8.5)
      WRITE(MX,566)
  566 FORMAT(/,41X,'WEIGHTED MONTHLY RAINFALL IN MILLIMETER')
      WRITE(MX,350)RMONT
      WRITE(MX,360)
C
      DO 580 I=1,NY
      IYEAR=IBG+I
      TOT=0.
      DO 570 J=1,12
      IF(SUM(I,J).LT.0.) TOT=-9999.
      IF(SUM(I,J).LT.0.) GO TO 570
      SUM(I,J)=IFIX((SUM(I,J)+0.05)*10.)/10.
      TOT=TOT+SUM(I,J)
  570 CONTINUE
      TOT=IFIX((TOT+0.05)*10.)/10.
  580 WRITE(MX,390)IYEAR,(SUM(I,J),J=1,12),TOT
      WRITE(MX,360)
C
      WRITE(MX,400)AVR,ANL
```

```
C
C     PUNCH WEIGHTED MONTHLY RAINFALL
C
      IF(NPUNC.EQ.0) GO TO 800
      WRITE(MX,540)ANAME
      WRITE(MX,550) ((SCD(N,I),I=1,2),WRF(N) ,N=1,NS)
      WRITE(MX,565)S
      WRITE(MX,590)
      IBG=IBGN-1
C
      DO 600 I=1,NY
      IYEAR=IBG+I
      WRITE(MX,590)COD,IYEAR,(SUM(I,J),J=1,12)
  590 FORMAT(1X,A4,A2,I2,12F6.1)
  600 WRITE(MP,610)COD,IYEAR,(SUM(I,J),J=1,12)
  610 FORMAT(A4,A2,I2,12F6.1)
C
C     BRANCH TO NEXT AREA
C
  800 GO TO 100
C
  850 WRITE(MX,860)CODE,FAC,(SCD(N,I),I=1,2),SNAME
  860 FORMAT('1CODE OF THEISSEN FACTOR AND RAINFALL CODE WRONG'
     1,/,T34,A4,A2,F6.3,/,1X,A4,A2,2X,18A4)
C
  900 CALL EXIT
      END
```

n.2.2 INPUT DATA STREAM

```
      MONTH-01 RECORD OF THE FIRST AREA
      MONTH-02 RECORD OF THE FIRST RAIN GAGE STATION
      MONTHLY RAINFALL DATA OF THE FIRST STATION
      MONTH-02 RECORD OF THE NEXT RAIN GAGE STATION
      MONTHLY RAINFALL DATA OF THE NEXT STATION
      ..........................................
      ..........................................

      MONTH-02 RECORD OF THE LAST RAIN GAGE STATION
      MONTHLY RAINFALL DATA OF THE LAST STATION
      MONTH-01 RECORD OF THE NEXT AREA
      MONTH-02 AND MONTHLY RAINFALL OF ALL STATIONS FOR THE AREA
      ..........................................................
      MONTH-01 RECORD OF THE LAST AREA
      MONTH-02 AND MONTHLY RAINFALL OF ALL STATIONS FOR THE AREA
```

NOTE THE MONTHLY RAINFALL DATA CAN ENTER TO THE PROGRAM ANY PERIOD OF YEARS, ONLY THE YEARS THAT ARE IN THE PERIOD OF MONTH-01 DATA ARE SELECTED INTO THE CALCULATION, THE MONTHLY RAINFALL DATA OF YEARS IN THE PERIOD OF MONTH-01 DATA WHICH ARE NOT ENTERED ARE CREATED TO MISSING VALUE (-9999.).

ภาคผนวก ข

นโยบายดำเนินการอ่างเก็บน้ำเอนกประสงค์ของการไฟฟ้าฝ่ายผลิต

ข. นโยบายดำเนินการอ่างเก็บน้ำเอนกประสงค์ของการไฟฟ้าฝ่ายผลิต

ข.1 Introduction

The multipurpose reservoirs are one of the most important natural resources for socio-economic development of Thailand. Many projects such as the Bhumibol, the Sirikit on the Chao Phraya basin, the Ubol Ratana, the Sirindhorn, the Chulabhorn, the Nam Pung and the Kang Krachan multipurpose reservoirs have been carried on project by project to enhance the water resource benefits. The fruitful results of these projects now include irrigation, flood control, fishery, navigation on inland waterways, water supply for domestic and industrial uses, salinity and pollution water quality control and electric power generation etc. So, to fulfils various purposes, the operation of the multipurpose reservoirs are carried out based on the operation policy, operation rule and operation procedure which will be later described in this report.

ข.2 Operating Rules

In order to operate the reservoir to fulfil various purposes and give optimum to overall benefits, the operation rule curves of each reservoir are studied to be set up as an guideline for operation. The operation rule curves of the reservoir are :

1. Flood Control Rule Curve
2. Conservation Rule Curve or Upper Rule Curve
3. Buffer Rule Curve or Lower Rule Curve
4. Inactive Rule Curve

The operating rules of water release according to operation rule curves are as follows :-

1. Whenever the reservoir water level is higher than the Flood Control Rule Curve, excess water will be spilled.

2. Whenever the reservoir water level is higher than the Conservation Rule Curve or Upper Rule Curve, the water will be released at maximum generation capability in order to preserve storage for flood control and also to reduce the spill in the following months.

3. Whenever the reservoir water level is between Conservation Rule Curve (Upper Rule Curve) and Buffer Rule Curve (Lower Rule Curve), the water release will follow the operating policies under normal condition. The water will be released to meet downstream requirement and also the need of power.

หมายเหตุ แหล่งข้อมูลจากการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

4. Whenever the reservoir water level is below the Buffer Rule Curve (Lower Rule Curve) which is under emergency condition, the water release will be reduced. However, the minimum water release will be confined by Rationing Policy.

9.3 Operating Policies

The operation of the multipurpose reservoir is according to the downstream demand and the requirements of the electrical system which are acted as contraints in the release of water from the reservoirs. The operating policies of water release under normal circumstances are as follows :-

1. Water must be released from the reservoirs whenever it is required to the downstream.

2. The needs of the power system for power, energy and reserve capacity must always be satisfied when there is no other way to meet the system need.

3. Practical limits on minimum output from individual generating hydro plants for the needs of the system must to respected. It should make an effort to generate hydroplants not more than practical limits on minimum output during the period when downstream demands on the reservoir are low.

When the reservoir is under emergency condition, the water level falls below the Buffer Rule Curve (Lower Rule Curve). The water release will be reduced to avoid uncontrolled reservoir emptying. The operation of reservoir will follow the Rationing Policies which are described below :-

Rationing of Irrigation Demands

- in every month that the reservoir water level is below the Lower Rule Curve, irrigation deliveries will be reduced by confined percentage.
- if reservoir level is critically low at the end of November, a reduction in the fcllowing year's dry seasen crop area should be decided.

Rationing of Release for Power

- Besides the effort for the generation from hydro should be made of not more than practical limits on minimum output during the period when downstream demands are low, the generation should be reduced as minimum as possible when the reservoir is in emergency condition.

1.4 Operating Procedures

The multipurpose reservoirs are operated by the Electricity Generating Authority of Thailand (EGAT). The Royal Irrigation Department (RID) is responsible for the operation of the diversion dam downstream. Therefore, at the end of the wet season of the year around October to December, the working group which composes of RID's and EGAT's representatives jointly made a short range reservoir operation studies. The studies are based on the estimated irrigation requirement according to the purposed crop area, other water use demand and generation power requirement from hydros. The estimated water release from the reservoirs is finally determined according to the past record of the dry, medium dry, average, medium wet and wet hydrological conditions. The studies are purposed to be as guidelines for daily operation of the reservoirs.

Every week, RID estimates the downstream demands, the local flow, and the water requirements from the reservoirs based on daily basis and informs to EGAT to operate the reservoirs to meet the downstream demands.

1.5 Conclusion

The operation of the multipurpose reservoir practically follows the operating criterias as mentioned before. The water release from the reservoirs up to the present could satisfy several purposed needs. Besides, the extra short period demands for irrigation purpose due to abnormal low rainfall and local flow, pollution quality control, power generation could be satisfied too.

At present, the operation of the reservoirs to meet the significant downstream demands is the Bhumibol and the Sirikit dams in the Chao Phraya basin, and the Kang Krachan dam and will be the Srinagarind dam in the following year. The operation of the Ubol Ratana, the Chulabhorn, the Nam Pung release more water for power purpose than the downstream demands. The operation of the Sirindhorn is not restricted for power purpose while the irrigation project is developing.

In a near future, the water demands from the reservoirs will increase rapidly. The increasing of dry season crop and the irrigation projects under development will need much more water from the reservoirs. The need of water for domestic industrial uses and pollution quality control will gradually increase year by near. Besides, the fuel oil crisis is anticipated to be more serious in future and the quantity of the fuel oil is hardly adequate, then ,

more water may be needed for power generation. All of these will arise the problems of the operation of the reservoirs to contribute the water for increasing demands. The concerned authorities realize the future problems, therefore, the committee which composes of the Royal Irrigation Department, the Electricity Generating Authority, Department of Agricultural Extension, and Department of Local Government is recently set up in order to response for defining reservoir operating polocies. Then, the coordination of the water use among several purposes will be better in future.

ภาคผนวก ค

การคำนวณปริมาณการใช้น้ำของพืชจากข้อมูลภูมิอากาศ

ค. การคำนวณปริมาณการใช้น้ำของพืชจากข้อมูลภูมิอากาศ

ค.1 สูตรของ Penman

วิธีหรือสูตรของ Penman เป็นวิธีที่ได้รวมเอาพลังงานที่ก่อให้เกิดการระเหยการคายน้ำไว้ด้วยกัน พลังงานดังกล่าวนี้คือพลังงานที่ได้รับจากดวงอาทิตย์ ทำให้เกิด energy balance และพลังงานที่เกิดจากการเคลื่อนไหวของอากาศ (aerodynamic) คือ

$$ET_p = \frac{\Delta}{\Delta+\gamma}\left\{R_n + G\right\} + \frac{\gamma}{\Delta+\gamma}\left\{15.36\right\}\left\{1.0 + 0.0062\ U_2\right\}\left\{e_z^o - e_z\right\}$$

ในเมื่อ

ET_p = Potential Evapotranspiration

Δ = ความลาดเทของกราฟของความดันอิ่มตัว (Saturated Vapour Pressure)

γ = Psychromatic Constant (mb/ ^oC) คือ การสมดุลย์ระหว่างความร้อนที่รู้สึกซึ่งได้รับจากดวงอาทิตย์ไหลผ่านเทอร์มอมิเตอร์กระเปาะเปียกและความร้อนที่รู้สึกได้เปลี่ยนเปลงรูปเป็นความร้อนแฝง

$\gamma = C_p\ P/0.622\lambda$

$C_p = 0.240$

P = ความกดอากาศ

λ = ความร้อนแฝงในการเปลี่ยนเป็นไอน้ำ = 595-0.51 T

T = อุณหภูมิเฉลี่ย

R_n = รังสีแสงแดดสุทธิ (Langleys/day)

G = ปริมาณความร้อนในดินเฉลี่ยคิดเป็น Langleys/day ซึ่งปริมาณความร้อนในดินโดยประมาณในช่วงระยะเวลายาวนานหาได้โดยการกำหนดว่าอุณหภูมิของดินระยะลึก 2 เมตร เปลี่ยนเปลงโดยประมาณตามอุณหภูมิอากาศเฉลี่ยและความจุความร้อนโดยปริมาณเฉลี่ย ซึ่งสำหรับดิน คือ 0.5/cm^3/^oC

$$G = (T_{i-1} - T_{i+1})\ 100/\ t$$

t = จำนวนวันระหว่างจุดกลางของช่วง 2 ช่วง ในกรณีนี้ใช้ค่า t คือ 60 วัน

u_2 = ความเร็วเฉลี่ยของลมสูงจากพื้นดิน 2 เมตร
ถ้าหากไม่มีการวัดความเร็วของลมที่ระดับ 2 เมตรไว้ ก็อาจเปลี่ยนแปลงค่าที่ได้ในระดับอื่นมาเป็นค่าที่ระดับ 2 เมตร โดยการใช้สูตร

$$u_2 = u_z \frac{(2)}{z}^{0.2}$$

u_2 = ความเร็วของลมเป็นกิโลเมตรต่อวัน ที่ระดับเหนือพื้นดิน Z เมตร

$(e_z^o - e_z)$ = การลดความกันไอ (mb)

ข้อมูลที่ใช้ในการคำนวณหา Potential Evapotranspiration

ในการคำนวณหา Potential Evapotranspiration ครั้งนี้ ได้ใช้ข้อมูลสถิติทางภูมิอากาศรายเดือนเฉลี่ยของกรมอุตุนิยมวิทยา (ปี ค.ศ.1952 - 1970) ซึ่งข้อมูลที่ใช้ได้แก่

- อุณหภูมิอากาศเฉลี่ยสูงสุด
- อุณหภูมิอากาศเฉลี่ยปานกลาง
- อุณหภูมิของจุดน้ำค้าง
- ความชื้นสัมพัทธ์
- ความเร็วลมเฉลี่ยในระดับความสูง 2 เมตร
- ความกดอากาศ
- ชั่วโมงแสงแดดเฉลี่ย ซึ่งถ้าไม่มีก็ใช้การคำนวณจากเปอร์เซนต์ของแสงแดด

ECHO OF ALL READ-IN DATA

LATITUDE(DEGREES)-CLOUDLESS SKY MEAN SOLAR RADIATION(CAL.CM-2.DAY-1) TABLE

LATITUDE	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
10.0	584.0	701.0	681.0	707.0	684.0	700.0	681.0	665.0	707.0	648.0	617.0	565.0
15.0	545.0	673.0	671.0	713.0	706.0	733.0	706.0	684.0	697.0	623.0	580.0	519.0
20.0	500.0	634.0	652.0	720.0	726.0	760.0	729.0	697.0	680.0	597.0	537.0	474.0

STATION IDENTIFICATION

STATION NAME UBON RATCHATHANI
STATION INDEX 32767
LATITUDE 15.2
LONGITUDE 104.8
WINDGAUGE HEIGHT 12.3METRES ABOVE GROUND

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
CLOUD	3.1	3.4	3.8	4.8	5.9	6.5	6.6	6.9	6.5	5.1	3.8	3.4
DEW PT T	16.1	17.8	19.9	22.1	23.7	21.9	23.8	23.8	23.7	22.1	19.3	16.9
MEAN TEM	24.0	26.3	28.6	29.9	29.2	28.2	27.9	27.4	27.2	25.7	25.3	23.9
MAX TEMP	31.0	33.2	35.2	35.8	34.4	32.6	32.0	31.4	31.2	31.2	30.2	30.0
MIN TEMP	17.0	19.3	22.3	24.2	24.6	24.4	24.2	24.0	23.8	22.5	20.1	17.7
WIND	4.5	3.8	3.5	3.6	3.5	4.3	4.5	4.4	3.4	4.6	6.1	5.8
REL HUMD	64.0	62.0	61.0	65.0	74.0	79.0	79.0	82.0	82.0	77.0	71.0	67.0
PRESSURE	1013.3	1011.3	1009.7	1008.2	1006.8	1005.8	1005.8	1005.7	1007.1	1009.8	1012.0	1013.4

CLOUDLESS SKY MEAN SOLAR RADIATION IN CAL.CM-2.DAY-1 AT UBON RATCHATHANI

JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
543	671	670	713	707	734	707	685	696	622	578	517

MEAN SOLAR RADIATION IN CAL.CM-2.DAY-1 AT UBON RATCHATHANI USING CLOUD

MONTH	CLOUDLESS SKY MEAN SOLAR RADIATION CAL.CM-2.DAY-1	PERCENT CLOUD COVER	PERCENT SUNSHINE	MEAN SOLAR RADIATION CAL.CM-2.DAY-1
JANUARY	543	38.75	78.21	449
FEBRUARY	671	42.50	75.91	546
MARCH	670	47.50	72.77	532
APRIL	713	59.99	64.49	530
MAY	707	73.75	54.40	482
JUNE	734	81.25	48.23	473
JULY	707	82.50	47.14	451
AUGUST	685	86.25	43.70	422
SEPTEMBER	696	81.25	48.23	448
OCTOBER	622	63.75	61.86	452
NOVEMBER	578	47.50	72.77	459
DECEMBER	517	42.50	75.91	420

USING CLOUD MEANS PERCENT SUNSHINE WAS COMPUTED USING CLOUD COVER DATA AND NOT READ-IN DIRECTLY

MEAN NET RADIATION IN CAL.CM-2.DAY-1 AT UBON RATCHATHANI

MONTH	MEAN SOLAR RADIATION	NET OUTGOING LONGWAVE RADIATION	NET OUTGOING THERMAL RADIATION	MEAN NET RADIATION
JANUARY	449	160	130	216
FEBRUARY	546	154	122	298
MARCH	532	144	111	299
APRIL	530	130	93	315
MAY	482	117	76	295
JUNE	473	129	79	285
JULY	451	114	69	278
AUGUST	422	113	65	260
SEPTEMBER	448	114	69	276
OCTOBER	452	125	87	261
NOVEMBER	459	142	110	243
DECEMBER	420	155	123	200

TERMS USED IN THE PENMAN FORMULA

MONTH	DELTA	GAMMA	DELTA/DELTA+GAMMA	GAMMA/DELTA+GAMMA	LAMBDA
JANUARY	1.78	0.67	0.72	0.27	582
FEBRUARY	2.01	0.67	0.75	0.24	581
MARCH	2.26	0.67	0.77	0.22	580
APRIL	2.42	0.67	0.78	0.21	579
MAY	2.33	0.66	0.77	0.22	580
JUNE	2.22	0.66	0.76	0.23	580
JULY	2.18	0.66	0.76	0.23	580
AUGUST	2.13	0.66	0.76	0.23	581
SEPTEMBER	2.11	0.66	0.75	0.24	581
OCTOBER	2.05	0.67	0.75	0.24	581
NOVEMBER	1.91	0.67	0.74	0.25	582
DECEMBER	1.77	0.67	0.72	0.27	582

PENMAN POTENTIAL EVAPOTRANSPIRATION AT UBON RATCHATHANI

MONTH	NET RADIATION CAL.CM-2.DAY-1	SOIL HEAT FLUX CAL.CM-2.DAY-1	SATURATION DEFICIT MB	POTENTIAL EVAPOTRANSPIRATION MM/DAY	MM/MONTH
JANUARY	216	-4.1	13.05	4.02	125
FEBRUARY	298	-7.6	15.41	5.16	145
MARCH	299	-5.9	18.02	5.39	167
APRIL	315	-0.9	17.06	5.59	168
MAY	295	2.8	12.67	5.01	155
JUNE	285	2.1	9.66	4.66	140
JULY	278	1.3	9.18	4.52	140
AUGUST	260	1.1	7.97	4.15	129
SEPTEMBER	276	1.1	7.88	4.30	129
OCTOBER	261	3.1	9.37	4.32	134
NOVEMBER	243	4.8	11.07	4.39	132
DECEMBER	200	2.1	11.58	3.66	120

รูปที่ ค.1 แสดงผลการคำนวณค่าปริมาณการใช้น้ำของพืชโดยสูตร Penman ด้วยโปรแกรมคอมพิวเตอร์

ก.2 Modified Penman Formula จากหนังสือ Irrigation, Theory and Practice ของ A.M. Michael

$$ET_o = \frac{\Delta}{\Delta+\gamma}\left[R_A(1-\ell)(0.25+0.5\frac{n}{N}) - \sigma T_a^4 (0.34-0.044\sqrt{ed}) \cdot (0.1+0.9\frac{n}{N})\right] + \left[(1-\frac{\Delta}{\Delta+\gamma})(0.27)(1+0.01\,U_2)(e_a - e_d)\right]$$

ET_o = evapotranspiration in mm/day

Δ = rate of change of the saturation of vapor pressure with temperature in mb/c°

γ = psychrometric constant

R_A = extra - terrectrial radiation in mm/day

ℓ = reflection coefficient

= 0.25

$\frac{n}{N}$ = percent of actual and possible hours of bright sunshine

σ = $74.5+9.5\,C_c-2.0\,C_c^2$ where C_c = Cloudiness

= Stefan - Boltzmann Coefficient (2.01768×10^{-9})

T_a = Absolute mean air temperature in K°

e_a = Saturation vapor pressure of the atmosphere in mb at the mean air temperature in °C

e_d = actual vapor pressure of air in mb

= e_a x relative humidity

U_2 = wind speed in km/day at 2 m height above ground surface

= $U_1 \frac{\log 6.6}{\log h} = 0.82 \frac{U_1}{\log h}$ where h = height of wind vane above ground in ft. which U_1 is measured in km/day

ตารางที่ ค.1 ตารางคำนวณ Evapotranspiration โดยวิธี Modified Penman

ข้อมูลสถิติอุตุนิยมวิทยาจากสถานี .อุบลราชธานี

Latitude 15° 15' ...Longitude., 104° 52' .....

โครงการ ขอประทานโคมน้อย .....

อำเภอ..พิบูลมังสาหาร..จังหวัด..อุบลราชธานี

ที่	รายการ	ที่มา	หน่วย	มค.	กพ.	มีค.	เมย.	พค.	มิย.	กค.	สค.	กย.	ตค.	พย.	ธค.	รวม
1	อุณหภูมิเฉลี่ย	จากสถิติฯ	°C	24.0	26.3	28.8	29.9	29.2	28.2	27.9	27.4	27.2	26.7	25.3	23.8	-
2	อุณหภูมิสมบูรณ์	1 + 273	°K	297.0	299.3	301.8	302.9	302.2	301.2	300.9	300.4	300.2	299.7	298.3	296.8	
3	ความชื้นสัมพัทธ์เฉลี่ย	จากสถิติฯ	%	64.0	62.2	61.0	65.0	74.0	79.0	79.0	82.0	82.0	77.0	71.0	67.0	
4	e_a	ตาราง 12	มิลลิบาร์	29.83	34.21	39.59	42.19	40.52	38.24	37.58	36.49	38.24	35.02	32.24	29.47	
5	e_d	$\frac{3 \times 4}{100}$	มิลลิบาร์	19.09	21.28	24.15	27.42	29.98	30.21	29.69	29.92	31.36	26.97	22.89	19.74	
6	$e_a - e_d$	4 -5	มิลลิบาร์	10.74	12.93	15.44	14.77	10.54	8.03	7.89	6.57	6.88	8.05	9.35	9.72	
7	$\frac{\Delta}{\Delta+\gamma}$	ตาราง 13	-	0.775	0.752	0.730	0.719	0.726	0.735	0.738	0.742	0.744	0.747	0.762	0.777	
8	$1-\frac{\Delta}{\Delta+\gamma}$	ตาราง 13	-	0.225	0.248	0.270	0.281	0.274	0.265	0.262	0.258	0.256	0.253	0.238	0.223	
9	ความเร็วลมที่ทำการวัดไว้ (U_1)	จากสถิติฯ	Knots	4.5	3.8	3.6	3.6	3.5	4.3	4.5	4.4	3.4	4.6	6.1	5.8	
10	ความเร็วลมที่ระดับ ๒ ม. (U_2)	$\frac{9 \times 36.41}{\log h}$	กม./วัน	150	127	120	120	117	144	150	147	116	154	204	194	
11	R_A	ตาราง 14	มม./วัน	11.72	13.05	14.44	15.36	15.63	15.60	15.56	15.19	14.70	14.07	12.95	12.31	
12	Cloudiness Ratio (C_o)	จากสถิติฯ	Oktas	3.1	3.4	3.8	4.8	5.9	6.5	6.6	6.9	6.5	5.1	3.8	3.4	
13	$n/N=74.5+9.5C_c-2.0\ C_c^2/100$	จากการคำนวณ	-	0.848	0.836	0.816	0.740	0.609	0.517	0.500	0.448	0.517	0.709	0.817	0.837	
14	Evapotranspiration	จากการคำนวณ	มม./วัน	4.67	5.46	6.42	6.58	5.63	5.10	5.03	4.53	4.55	5.16	5.38	5.02	
15	Evapotranspiration	14x จำนวนวัน	มม./เดือน	144.8	152.9	199.0	197.4	174.5	153.0	155.9	140.4	136.5	160.0	161.4	155.6	1931.4

หมายเหตุ :- ๑. สถิติที่ใช้ได้จากหนังสือสถิติภูมิอากาศของกรมอุตุนิยมวิทยา

๒. ความสูงของเครื่องวัดความเร็วลมจากพื้นดิน(h) 12.30 ม.

ภาคผนวก ง

โปรแกรมคอมพิวเตอร์ย่องผู้ดโปรแกรม IDM01

ง. รายละเอียดโปรแกรมคอมพิวเตอร์ของชุดโปรแกรม IDMO1

```
C     INTRODUCTION
C     ************

C     THE IRRIGATION DEMAND MODEL PROGRAM USED FOR PRODUCING MONTHLY
C     DIVERSION DEMANDS AND RETURN FLOWS FOR A GIVEN PERIOD OF WEIGHTED
C     RAINFALL AND/OR EFFECTIVE RAINFALL.

C     THE INPUT CONSISTS OF THE TITLE RECORD, OPTION RECORD, CROP DATA
C     (CROP DESCRIPTIONS, CROPPED AREAS AND CROP EVAPOTRANSPIRATIONS),
C     EFFECTIVE RAIN FACTOR, FARM EFFICIENCY, CANAL EFFICIENCY, RETURN
C     FLOW FACTOR, EVAPOTRANSPIRATION FOR UNCROPPED AREA, WEIGHTED
C     RAINFALL AND/OR EFFECTIVE RAINFALL (OPTION).

C     IF THE EFFECTIVE RAINFALL ARE NOT ENTERED FROM THE INPUT STREAM,
C     THE PROGRAM COMPUTES EFFECTIVE RAINFALL BY THE METHOD SPECIFY IN
C     THE OPTION RECORD OF INPUT DATA. THEN THE PROGRAM COMPUTES
C     DIVERSION DEMANDS AND RETURN FLOWS (OPTION).

C     THE OUTPUT CONSISTS OF ECHO INPUT DATA, EFFECTIVE RAINFALL,
C     DIVERSION DEMANDS IN MCM AND CMS, ACCUMULATED DEMANDS IN MCM,
C     RETURN FLOWS IN MCM (OPTION), DIVERSION DEMANDS AND RETURN FLOWS
C     IN CARD FORM IF REQUIRED FOR USE IN RESERVOIR SIMULATION MODEL
C     PROGRAM.

C     THE PROGRAM REQUIRED  8,127 WORDS OF CORE MEMORY ON THE UNIVAC
C     1106 SYSTEM. THE IBM 1130 VERSION USED OVERLAYS TO FIT 8K WORDS.

C     MAIN PROGRAM
C     ************
C
C     IRRIGATION DEMAND MODEL PROGRAM
C     PROGRAMMER * SUPOT PROMNARET * AUGUST 1977
C
C     THE PROGRAM CAN SIMULATE DIVERSION DEMAND UP TO 50 YEARS AND 20
C     CROP CALENDARS
C
      DIMENSION ERF(12),FEF(12),CEF(12),RFF(12),ETP(12),RMONT(12)
     1,         IDCP(20),ITEM(20),CP(20,6),AR(20,12),ET(20,12),EWR(20,12
     2,         WRFL(50,12),ERFL(50,12),DWR(50,12),RFLO(50,12)
     3,         PNAME(20),PCODE(2),AMEAN(12)
      EQUIVALENCE (CP(1,1),EWR(1,1)),(ERFL(1,1),RFLO(1,1))
      DATA RMONT/' APR',' MAY',' JUN',' JUL',' AUG',' SEP',' OCT',' NOV'
     1,' DEC',' JAN',' FEB',' MAR'/
      DATA MP,MX,MY/1,6,5/,NYDMS/50/
C
C     READ TITLE
C
  100 READ(MY,110,END=900)PNAME
  110 FORMAT(20A4)
C
C     READ MINIMUM DEMAND FACTOR, EFFECTIVE RAINFALL COMPUTATION
C     OPTION, RETURN FLOW OPTION, PROJECT AREA, DEMAND AND RETURN FLOW
C     PUNCH OUTPUT OPTIONS AND PROJECT CODE
C
      READ(MY,120)RMINF,IEFRF,IRTFO,AREA ,IDMNP,IRTFP,PCODE
  120 FORMAT(8X,3G6.0,F12.0,2G6.0,A4,A2)
C
C     SUBROUTINE TO READ CROP CALENDARS
C
      CALL CROPIT(AMEAN,IDCP,ITEM,CP,AR,ET,NCP,MX,MY)
C
C     READ EFFECTIVE RAIN FACTOR, FARM EFFICIENCY, CANAL EFFICIENCY,
C     RETURN FLOW FACTOR AND EVAPOTRANSPIRATION FOR UNCROPPED AREA
C
      READ(MY,130)ERF,FEF,CEF,RFF,ETP
  130 FORMAT(8X,12G6.0)
C
C     SUBROUTINE TO PRINT CROP CALENDARS
C
      CALL HEADG(    1,PNAME,MX)
      CALL CROPO(RMONT,NCP,IDCP,ITEM,CP,AR,ET,ERF,FEF,CEF,RFF,ETP
     1,          RMINF,AREA,IEFRF,MX)
```

หมายเหตุ จากโปรแกรมสำเร็จรูป ของศูนย์คอมพิวเตอร์ กรมชลประทาน

```
C
C     SUBROUTINE TO READ WEIGHTED MONTHLY RAINFALL
C
      IF(IEFRF.EQ.0.AND.IRTFO.EQ.0) GO TO 200
      CALL MRFLI(MYDMS,NYEAR,AMEAN, WRFL,IBGIN,MY)
C
C     SUBROUTINE TO FIND MEAN OF WEIGHTED MONTHLY RAINFALL
C
      CALL MEANM(   12,NYEAR, WRFL,AMEAN)
C
C     SUBROUTINE TO PRINT WEIGHTED MONTHLY RAINFALL
C
      CALL HEADG(    2,PNAME,MX)
      CALL OUTMN(IBGIN,NYEAR, WRFL,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO FILL WEIGHTED MONTHLY AVERAGE TO MISSING VALUES
C
      CALL MEANF(   12,NYEAR, WRFL,AMEAN)
      IF(IEFRF.GT.0) GO TO 300
C
C     EFFECTIVE MONTHLY RAINFALL ENTER FROM INPUT STREAM
C
  200 CALL MRFLI(MYDMS,NYEAR,AMEAN, ERFL,IBGIN,MY)
C     CALL MEANM(   12,NYEAR, ERFL,AMEAN)
      CALL MEANF(   12,NYEAR, ERFL,AMEAN)
      GO TO 400
C
C     SUBROUTINE TO COMPUTE EFFECTIVE RAINFALL
C
  300 IF(IEFRF.EQ.1) CALL EFRF1(NYEAR,WRFL,ERFL,ERF)
      IF(IEFRF.EQ.2) CALL EFRF2(NYEAR,WRFL,ERFL)
      IF(IEFRF.EQ.3) CALL EFRF3(NYEAR,WRFL,ERFL)
      IF(IEFRF.EQ.4) CALL EFRF4(NYEAR,WRFL,ERFL)
      IF(IEFRF.GT.4) CALL EXIT
      CALL MEANM(   12,NYEAR, ERFL,AMEAN)
C
C     SUBROUTINE TO PRINT EFFECTIVE RAINFALL
C
  400 CALL HEADG(    3,PNAME,MX)
      CALL OUTMN(IBGIN,NYEAR, ERFL,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO COMPUTE DEMAND AND RETURN FLOW
C
      CALL DEMAN(NYEAR,NCP,ET,ERFL,FEF,RMINF,AR,CEF,FWR,DWR,AMEAN)
      IF(IRTFO.GT.0)
     1CALL RFLOW(NYEAR,NCP,AR,ET,FWR,CEF,WRFL,AREA,RFF,FTP,ITEM,RFLO)
C
C     SUBROUTINE TO PRINT DEMAND IN MCM
C
      CALL HEADG(    4,PNAME,MX)
      CALL MEANM(   12,NYEAR,  DWR,AMEAN)
      CALL OUTMN(IBGIN,NYEAR,  DWR,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO PRINT DEMAND IN CMS
C
      CALL HEADG(    5,PNAME,MX)
      CALL OUTSD(IBGIN,NYEAR,  DWR,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO PRINT ACCUMULATED DEMAND IN MCM
C
      CALL HEADG(    6,PNAME,MX)
      CALL ACCUM(IBGIN,NYEAR,  DWR,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO PRINT RETURN FLOW IN MCM
C
      IF(IRTFO.EQ.0) GO TO 450
      CALL HEADG(    7,PNAME,MX)
      CALL MEANM(   12,NYEAR, RFLO,AMEAN)
      CALL OUTMN(IBGIN,NYEAR, RFLO,AMEAN,RMONT,MX)
C
C     SUBROUTINE TO PUNCH DEMAND AND RETURN FLOW
C
  450 IF(IDWP.EQ.0) GO TO 500
      CALL HEADG(    8,PNAME,MX)
      CALL PCARD(IFCODE,NYEAR,  DWR,IBGIN,1,MP,MX)
  500 IF(IRTFP.EQ.0) GO TO 600
      IF(IRTFO.EQ.0) GO TO 600
```

```
      CALL HEADGI    9,PNAME,MX)
      CALL MCARD(PCODE,NYEAR, RFLO,IBGIN,2,MP,MX)
C
C     BRANCH TO NEXT CASE
C
  600 GO TO 100
C
  900 CALL EXIT
      END
```

HEADG SUBROUTINE

```
C     SUBROUTINE TO PRINT HEADING
C
      SUBROUTINE HEADG(NFORM,PNAME,MX)
      DIMENSION PNAME(20)
C
      WRITE(MX,100)PNAME,NFORM
  100 FORMAT('1ROYAL IRRIGATION DEPARTMENT, THAILAND'
     1,T107,'COMPUTER CENTER',/,1X,20A4,T107,'DEMAND MODEL',I3)
C
      GO TO (150,200,300,400,500,600,700,400,700),NFORM
  150 WRITE(MX,160)
  160 FORMAT(/,43X,'CROP CALENDARS, CROPPED AREAS IN RAI')
      GO TO 900
  200 WRITE(MX,210)
  210 FORMAT(/,45X,'WEIGHTED RAINFALL IN MILLIMETERS')
      GO TO 900
  300 WRITE(MX,310)
  310 FORMAT(/,44X,'EFFECTIVE RAINFALL IN MILLIMETERS')
      GO TO 900
  400 WRITE(MX,410)
  410 FORMAT(/,40X,'DIVERSION DEMAND IN MILLION CUBIC METERS')
      GO TO 900
  500 WRITE(MX,510)
  510 FORMAT(/,38X,'DIVERSION DEMAND IN CUBIC METERS PER SECOND')
      GO TO 900
  600 WRITE(MX,610)
  610 FORMAT(/,40X,'ACCUMULATED DEMAND IN MILLION CUBIC METERS')
      GO TO 900
  700 WRITE(MX,710)
  710 FORMAT(/,42X,'RETURN FLOW IN MILLION CUBIC METERS')
C
  900 RETURN
      END
```

CROPI SUBROUTINE

```
C     SUBROUTINE TO READ CROP CALENDARS
C
      SUBROUTINE CROPI(DUMMY,IDCP,ITEM,CP,AR,ET,NCP,MX,MY)
      DIMENSION IDCP(20),ITEM(20),CP(20,6),AR(20,12),ET(20,12),DUMMY(12)
C
C     READ CROP DESCRIPTIONS
C
      K=0
  200 READ(MY,210)IC,IT,(DUMMY(I),I=1,6)
  210 FORMAT(3X,I2,1X,I2,2X,6A4)
      IF(IC.EQ.0) GO TO 240
      K=K+1
      IDCP(K)=IC
      ITEM(K)=IT
      DO 230 I=1,6
  230 CP(K,I)=DUMMY(I)
      GO TO 200
C
C     INITIALIZE CROP AREAS AND EVAPOTRANSPIRATIONS TO ZEROES
C
  240 NCP=K
      DO 245 K=1,NCP
      DO 245 M=1,12
      AR(K,M)=0.
  245 ET(K,M)=0.
C
```

```
C     READ CROPPED AREAS
C
  250 READ(MY,260)IC,IT,DUMMY
  260 FORMAT(3X,I2,1X,I2,12F6.0)
      IF(IC.EQ.0) GO TO 300
      DO 290 K=1,NCP
      IF(IC.EQ.IDCP(K).AND.IT.EQ.ITEM(K)) GO TO 270
      GO TO 290
  270 DO 280 M=1,12
  280 AR(K,M)=DUMMY(M)
      GO TO 250
  290 CONTINUE
      WRITE(MX,295)
  295 FORMAT(' AR ID NOT CORRESPOND TO CP ID')
      CALL EXIT
C
C     READ CROP EVAPOTRANSPIRATIONS
C
  300 READ(MY,260)IC,IT,DUMMY
      IF(IC.EQ.0) GO TO 350
      DO 330 K=1,NCP
      IF(IC.EQ.IDCP(K).AND.IT.EQ.ITEM(K)) GO TO 310
      GO TO 330
  310 DO 320 M=1,12
  320 ET(K,M)=DUMMY(M)
      GO TO 300
  330 CONTINUE
      WRITE(MX,340)
  340 FORMAT(' ET ID NOT CORRESPOND TO CP ID')
      CALL EXIT
C
  350 RETURN
      END

      CROPO SUBROUTINE
      ================

C     SUBROUTINE TO PRINT CROP CALENDARS
C
      SUBROUTINE CROPO(RMONT,NCP,IDCP,ITEM,CP,AR,ET,ERF,FEF,CEF,REF,ETP
     1,                RMINF,AREA,IEFRF,MX)
      DIMENSION IDCP(20),ITEM(20),CP(20,6),AR(20,12),ET(20,12),RMONT(12)
     1,         ERF(12),FEF(12),CEF(12),REF(12),ETP(12)
C
      WRITE(MX,720)RMONT
  720 FORMAT(/,' CROP  ITEM  DESCRIPTION',T38,12(3X,A4))
      WRITE(MX,730)
  730 FORMAT(/,1X,120('='))
C
      DO 760 K=1,NCP
C
      DO 735 M=1,12
      IF(AR(K,M).GT.0.) GO TO 745
  735 CONTINUE
      WRITE(MX,740)IDCP(K),ITEM(K),(CP(K,I),I=1,6)
  740 FORMAT(/,I5,I6,2X,6A4,12F7.0)
      GO TO 760
C
  745 WRITE(MX,740)IDCP(K),ITEM(K),(CP(K,I),I=1,6),(AR(K,M),M=1,12)
      WRITE(MX,750)(ET(K,M),M=1,12)
  750 FORMAT(13X,'EVAPOTRANSPIRATION, MM',T38,12F7.0)
  760 CONTINUE
C
      WRITE(MX,730)
      WRITE(MX,770)ERF,FEF,CEF,REF,ETP,RMINF,AREA,IEFRF
  770 FORMAT(/,T14,'EFFECTIVE RAIN FACTOR',T38,12F7.2
     1, /,T14,'FARM EFFICIENCY',T38,12F7.2
     2, /,T14,'CANAL EFFICIENCY',T38,12F7.2
     3, /,T14,'RETURN FLOW FACTOR',T38,12F7.2
     4, /,T14,'UNCROPPED AREA ETP, MM ',12F7.0
     5, /,T14,'MINIMUM DEMAND FACTOR',T38,F7.2
     6, /,T14,'PROJECT AREA, RAI',T32,F14.0
     7, /,T14,'EFFECTIVE RAINFALL COMPUTATION OPTION',I3)
C
      RETURN
      END
```

MRFLI SUBROUTINE

```
C     SUBROUTINE TO READ MONTHLY RAINFALL
C
      SUBROUTINE MRFLI(NYDMS,NYEAR,DUMMY,WRFL,IBGIN,MY)
      DIMENSION WRFL(50,12),DUMMY(12)
C
C     INITIALIZE MONTHLY RAINFALL TO MISSING VALUES
C
      DO 365 M=1,12
      DO 365 N=1,NYDMS
  365 WRFL(N,M)=-9999.
C
C     READ HEADER RECORD
C
      READ(MY,370)
C
C     READ MONTHLY RAINFALL
C
      DO 400 L=1,NYDMS
      READ(MY,370,END=390)IYEAR,DUMMY
  370 FORMAT(6X,I2,12F6.0)
      IF(IYEAR.EQ.0) GO TO 390
      IF(L.EQ.1) IBGIN=IYEAR-1
      N=IYEAR-IBGIN
      IF(N.LT.1.OR.N.GT.NYDMS) GO TO 400
C
      DO 380 M=1,12
      IF(DUMMY(M).LT.0.) GO TO 380
      WRFL(N,M)=DUMMY(M)
  380 CONTINUE
      GO TO 400
C
  390 NYEAR=L-1
      GO TO 410
  400 CONTINUE
      NYEAR=NYDMS
  410 RETURN
C
  900 CALL EXIT
      END
```

MEANM SUBROUTINE

```
C     SUBROUTINE TO FIND MEAN OF MONTHLY DATA
C
      SUBROUTINE MEANM(NMONT,NYEAR,DATAM,AMEAN)
      DIMENSION DATAM(50,12),AMEAN(12),COUNT(12)
C
      DO 100 M=1,NMONT
      AMEAN(M)=0.
  100 COUNT(M)=0.
C
      DO 200 M=1,NMONT
      DO 200 N=1,NYEAR
      IF(DATAM(N,M).LT.0.) GO TO 200
      AMEAN(M)=AMEAN(M)+DATAM(N,M)
      COUNT(M)=COUNT(M)+1.
  200 CONTINUE
C
      DO 300 M=1,NMONT
      AMEAN(M)=AMEAN(M)/COUNT(M)
  300 CONTINUE
C
      RETURN
      END
```

```
      MEANF SUBROUTINE
      ================

C     SUBROUTINE TO FILL MONTHLY AVERAGE TO MISSING VALUES
C
      SUBROUTINE MEANF(NMONT,NYEAR,DATAM,AMEAN)
      DIMENSION DATAM(50,12),AMEAN(12)
C
      DO 450 M=1,NMONT
      DO 450 N=1,NYEAR
      IF(DATAM(N,M).LT.0.) DATAM(N,M)=AMEAN(M)
  450 CONTINUE
C
      RETURN
      END

      OUTMN SUBROUTINE
      ================

C     SUBROUTINE TO PRINT MONTHLY DATA
C
      SUBROUTINE OUTMN(IBGIN,NYEAR,DATAM,AMEAN,RMONT,MX)
      DIMENSION DATAM(50,12),AMEAN(12),RMONT(12)
C
      WRITE(MX,500)RMONT
  500 FORMAT(/,' WATER YEAR',3X,12(4X,A4),5X,'ANNUAL')
      WRITE(MX,600)
  600 FORMAT(/,1X,120('-'),/)
C
      DO 700 N=1,NYEAR
      IYEAR=IBGIN+N+1900
C
      ANUAL=0.
      DO 650 M=1,12
      IF(DATAM(N,M).LT.0.) GO TO 640
      ANUAL=ANUAL+DATAM(N,M)
      GO TO 650
  640 ANUAL=-9999.
      GO TO 660
  650 CONTINUE
C
  660 WRITE(MX,680)IYEAR,(DATAM(N,M),M=1,12),ANUAL
  680 FORMAT(1X,I4,3X,12(1X,F7.2),4X,F7.2)
  700 CONTINUE
      WRITE(MX,600)
C
      ANUAL=0.
      DO 750 M=1,12
  750 ANUAL=ANUAL+AMEAN(M)
      WRITE(MX,800)AMEAN,ANUAL
  800 FORMAT('  AVERAGE',3X,12(1X,F7.2),4X,F7.2)
C
      RETURN
      END

      DEMAN SUBROUTINE
      ================

C     SUBROUTINE TO COMPUTE IRRIGATION DIVERSION DEMAND
C
      SUBROUTINE DEMAN(NYEAR,NCP,ET,ERFL,FEF,RMINF,AR,CEF,FWR,DWR,CWR)
      DIMENSION AR(20,12),ET(20,12),FWR(20,12),ERFL(50,12),DWR(50,12)
     1,         FEF(12),CEF(12),CWR(12)
C
      DO 700 N=1,NYEAR
C
C     FARM WATER REQUIREMENTS IN MILLIMETER
C
      DO 620 K=1,NCP
      DO 620 M=1,12
      FWR(K,M)=0.
      IF(ET(K,M).EQ.0.) GO TO 620
      FWR(K,M)=(ET(K,M)-ERFL(N,M))/FEF(M)
      FWRMN=RMINF*ET(K,M)/FEF(M)
      IF(FWR(K,M).LT.FWRMN) FWR(K,M)=FWRMN
  620 CONTINUE
C
```

```
C     CROP WATER REQUIREMENTS IN MCM
C
      DO 630 M=1,12
      CWR(M)=0.
      DO 630 K=1,NCP
      IF(AR(K,M).EQ.0.) GO TO 630
      CWR(M)=CWR(M)+FWR(K,M)*AR(K,M)*10.E-7
  630 CONTINUE
C
C     DIVERSION WATER REQUIREMENTS IN MCM
C
      DO 640 M=1,12
  640 DWR(N,M)=CWR(M)/CEF(M)
  700 CONTINUE
C
      RETURN
      END
```

RFLOW SUBROUTINE

```
C     SUBROUTINE TO COMPUTE RETURN FLOW
C
      SUBROUTINE RFLOW(NYEAR,NCP,AR,FT,FWR,CEF,WRFL,AREA,RFF,ETP,ITEM
     1,                RFLO)
      DIMENSION AR(20,12),FT(20,12),FWR(20,12),WRFL(50,12),RFLO(50,12)
     1,         CEF(12),RFF(12),ETP(12),ITEM( 1)
C
      DO 700 N=1,NYEAR
      DO 700 M=1,12
      AREAC=0.
      RFLO(N,M)=0.
C
      DO 650 K=1,NCP
C
C     NO RETURN FLOW FROM LAND PREPARATION (ITEM(K) = 1)
C
      IF(ITEM(K).EQ.1) GO TO 650
      IF(AR(K,M).EQ.0.) GO TO 650
C
C     CROPPED AREAS
C
      AREAC=AREAC+AR(K,M)
C
C     RETURN FLOW FROM FARM (WATER DELIVERY - CONSUMPTIVE USE)
C
      IF((FWR(K,M)/CEF(M)).LE.FT(K,M)) GO TO 650
      RFLO(N,M)=RFLO(N,M)+(FWR(K,M)/CEF(M)-ET(K,M))*AR(K,M)*10.E-7
  650 CONTINUE
C
C     RETURN FLOW FROM RAINFALL IN CROPPED AREA
C
      RFLO(N,M)=RFLO(N,M)+WRFL(N,M)*AREAC*10.E-7
C
C     RETURN FLOW FROM UNCROPPED AREA
C
      IF(WRFL(N,M).LE.ETP(M)) GO TO 660
      IF(AREA.LE.AREAC) GO TO 660
      RFLO(N,M)=RFLO(N,M)+(WRFL(N,M)-ETP(M))*(AREA-AREAC)*10.E-7
C
C     ACTUAL RETURN FLOW
C
  660 RFLO(N,M)=RFLO(N,M)*RFF(M)
  700 CONTINUE
C
      RETURN
      END
```

DCMSO SUBROUTINE

```
C     SUBROUTINE TO PRINT DIVERSION DEMAND IN CMS
C
      SUBROUTINE DCMSO(IBGIN,NYEAR,DATAM,AMEAN,RMONT,MX)
      DIMENSION DATAM(50,12),AMEAN(12),RMONT(12),CMS(12),SECND(13)
      DATA SECND/2.592,2.6784,2.592,2.6784,2.6784,2.592,2.6784,2.592
     1,2.6784,2.6784,2.4192,2.6784,31.536/
C
      WRITE(MX,500)RMONT
```

```
  500  FORMAT(/,' WATER-YEAR',3X,12(4X,A4),5X,'ANNUAL')
       WRITE(MX,600)
  600  FORMAT(/,1X,120('='),/)
C
       DO 700 N=1,NYEAR
       IYEAR=IBGIN+N+1900
C
       ANUAL=0.
       DO 650 M=1,12
       CMS(M)=DATAM(N,M)/SECND(M)
       ANUAL=ANUAL+DATAM(N,M)
  650  CONTINUE
       ANUAL=ANUAL/SECND(13)
C
       WRITE(MX,680)IYEAR,CMS,ANUAL
  680  FORMAT(I11,3X,12(1X,F7.3),4X,F7.3)
  700  CONTINUE
C
       WRITE(MX,600)
C
       ANUAL=0.
       DO 750 M=1,12
       CMS(M)=AMEAN(M)/SECND(M)
       ANUAL=ANUAL+AMEAN(M)
  750  CONTINUE
       ANUAL=ANUAL/SECND(13)
C
       WRITE(MX,800)CMS,ANUAL
  800  FORMAT('  AVERAGE',3X,12(1X,F7.3),4X,F7.3)
C
       RETURN
       END

       ACMCM SUBROUTINE

C      SUBROUTINE TO PRINT ACCUMULATED DEMAND IN MCM
C
       SUBROUTINE ACMCM(IBGIN,NYEAR,DATAM,VOMCM,RMONT,MX)
       DIMENSION DATAM(50,12),VOMCM(12),RMONT(12)
C
       WRITE(MX,500)RMONT
  500  FORMAT(/,' WATER YEAR',2X,12(5X,A4))
       WRITE(MX,600)
  600  FORMAT(/,1X,120('='),/)
C
       ACVOL=0.
       DO 700 N=1,NYEAR
       IYEAR=IBGIN+N+1900
C
       DO 650 M=1,12
       ACVOL=ACVOL+DATAM(N,M)
  650  VOMCM(M)=ACVOL
C
       WRITE(MX,680)IYEAR,VOMCM
  680  FORMAT(I11,2X,12F9.1)
  700  CONTINUE
C
       WRITE(MX,600)
       RETURN
       END

       MCARD SUBROUTINE

C      SUBROUTINE TO PUNCH MONTHLY DATA IN MONTHLY CARD FORMAT
C
       SUBROUTINE MCARD(PCODE,NYEAR,DATAM,IBGIN,IDR,MP,MX)
       DIMENSION PCODE(2),DATAM(50,12),DR(2)
       DATA DR/'D','R'/
C
       WRITE(MP,400)
       WRITE(MX,400)
C
       DO 300 N=1,NYEAR
       IYEAR=IBGIN+N
```

```
      WRITE(MP,250)DR(IDR),(PCODE(I),I=1,2),IYEAR,(DATAM(N,M),M=1,12)
  250 FORMAT(A1,A4,A1,I2,12F6.1)
  300 WRITE(MX,400)DR(IDR),(PCODE(I),I=1,2),IYEAR,(DATAM(N,M),M=1,12)
  400 FORMAT(1X,A1,A4,A1,I2,12F6.1)
C
      RETURN
      END

      EFRF1 SUBROUTINE
      ----------------

C     SUBROUTINE TO COMPUTE EFFECTIVE RAINFALL (OPTION 1)
C
      SUBROUTINE EFRF1(NYEAR,WRFL,ERFL,ERF)
      DIMENSION WRFL(50,12),ERFL(50,12),ERF(12)
C
      DO 100 M=1,12
      DO 100 N=1,NYEAR
  100 ERFL(N,M)=WRFL(N,M)*ERF(M)
C
      RETURN
      END

      EFRF2 SUBROUTINE
      ----------------

C     SUBROUTINE TO COMPUTE EFFECTIVF RAINFALL (OPTION 2)
C
      SUBROUTINE EFRF2(NYEAR,WRFL,ERFL)
      DIMENSION WRFL(50,12),ERFL(50,12),RFM(5),ERF(5)
      DATA RFM/ 10.,100.,200.,250.,300./
      DATA ERF/0.90,0.80,0.70,0.60,0.55/
C
      DO 200 M=1,12
      DO 200 N=1,NYEAR
C
      DO 100 L=1,5
      IF(WRFL(N,M).GT.RFM(L)) GO TO 100
      ERFL(N,M)=WRFL(N,M)*ERF(L)
      GO TO 200
  100 CONTINUE
C
      ERFL(N,M)=WRFL(N,M)*0.50
  200 CONTINUE
C
      RETURN
      END

      EFRF3 SUBROUTINE
      ----------------

C     SUBROUTINE TO COMPUTE EFFECTIVE RAINFALL (OPTION 3)
C
      SUBROUTINE EFRF3(NYEAR,WRFL,ERFL)
      DIMENSION WRFL(50,12),ERFL(50,12)
C
      DO 300 M=1,12
      DO 300 N=1,NYEAR
      RF=WRFL(N,M)
C
      GO TO (100,200,200,200,200,200,200,100,100,100,100,100),M
  100 IF(RF.LE.20.) ERF=0.
      IF(RF.GT.20..AND.RF.LE.50.) ERF=0.50*(RF-20.)
      IF(RF.GT.50..AND.RF.LE.100.) ERF=0.50*RF
      IF(RF.GT.100.) ERF=0.60*RF
      GO TO 300
C
  200 IF(RF.LE.10.) ERF=0.
      IF(RF.GT.10..AND.RF.LE.40.) ERF=0.50*(RF-10.)
      IF(RF.GT.40..AND.RF.LE.100.) ERF=0.60*RF
      IF(RF.GT.100.) ERF=0.75*RF
  300 ERFL(N,M)=ERF
C
      RETURN
      END
```

EFRF4 SUBROUTINE

```
C     SUBROUTINE TO COMPUTE EFFECTIVE RAINFALL (OPTION 4)
C
      SUBROUTINE EFRF4(NYEAR,WRFL,ERFL)
      DIMENSION WRFL(50,12),ERFL(50,12),RF(7),ERF7(7),ERFO(7)
      DATA RF/0.,25.,50.,100.,150.,200.,300./
      DATA ERF7/0.,25.,43.,58.,71.,82.,84./
      DATA ERFO/0.,25.,50.,80.,93.,100.,120./
C
      DO 500 M=1,12
      DO 500 N=1,NYEAR
      XX=WRFL(N,M)
C
      IF(XX.GT.0.) GO TO 110
      ERFL(N,M)=0.
      GO TO 500
C
  110 IF(M.EQ.7) GO TO 300
C
      DO 150 L=2,7
      IF(XX-RF(L))130,120,150
  120 ERFL(N,M)=ERFO(L)
      GO TO 500
C
  130 ERFL(N,M)=ERFO(L-1)+(ERFO(L)-ERFO(L-1))/(RF(L)-RF(L-1))
     1                                        *(XX-RF(L-1))
      GO TO 500
C
  150 CONTINUE
      ERFL(N,M)=120.
      GO TO 500
C
  300 DO 250 L=2,7
      IF(XX-RF(L))230,220,250
  220 ERFL(N,M)=ERF7(L)
      GO TO 500
C
  230 ERFL(N,M)=ERF7(L-1)+(ERF7(L)-ERF7(L-1))/(RF(L)-RF(L-1))
     1                                        *(XX-RF(L-1))
      GO TO 500
C
  250 CONTINUE
      ERFL(N,M)=84.
  500 CONTINUE
C
      RETURN
      END
```

ภาคผนวก จ

โปรแกรมคอมพิวเตอร์ของชุดโปรแกรม STRON

จ.1 รายละเอียดโปรแกรมคอมพิวเตอร์ของชุดโปรแกรม STRON

```
// JOB
// FOR
C     READ INPUT DATA
      DIMENSION PNAME(20),VMAXM(12),VMAXG(12),EVAPO(12),VEVOL(12)
     1,         VEELE(12),AEELE(12),AEARE(12),PHHED(12),PHCAP(12)
     2,         MDAY(12),VMINI(12),F(12),D(12)
     3,         HEHED(12),HEEFF(12),          VBUFF(12),CIMAG(20)
      DATA MDAY/30,31,30,31,31,30,31,30,31,31,28,31/
      DATA MX,MY/3,2/
C
C  READ TITLE CARD AND OPTION
      READ(MY,110,END=900) CIMAG
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VBGIN,MBGIN,IBGIN,NYEAR,CAPMW,FPMW1
     1,                    FPMW2,FACTR,LOSS,ATWEL,SCMAX
      WRITE(MX,210) CIMAG
  110 FORMAT(20A4,T9,12G6.0)
  210 FORMAT(1X,20A4)
C  READ TABLE
      READ(MY,110,END=900) CIMAG,EVAPO
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VEELE
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VEVOL
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,AEELE
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,AEARE
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,HEHED
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,HEEFF
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,PHHED
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,PHCAP
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VMAXM
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VMAXG
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VBUFF
      WRITE(MX,210) CIMAG
      READ(MY,110,END=900) CIMAG,VMINI
      WRITE(MX,210) CIMAG
C
      NVE=NCVPT(VEVOL)
      NAE=NCVPT(AEELE)
      NHP=NCVPT(PHHED)
      NHE=NCVPT(HEEFF)
      MBG=MBGIN
C
C  READ FLOW AND DEMAND
  300 READ(MY,120,END=900) IYEAR,F
      READ(MY,120,END=900) NYEAR,D
  120 FORMAT(T7,I2,T9,12G6.0)
      MDAY(2)=28
      IF((IYEAR+1900)-4*((IYEAR+1900)/4).EQ.0) MDAY(2)=29
C  CALL SUBROUTINE SIRIN
      CALL       SIRIN(PNAME,VMAXM,VMAXG,EVAPO,VEVOL,VEELE,AEELE,AEARE
     1,                PHHED,PHCAP,MDAY,IYEAR,VMINI,LOSS,CAPMW,FPMW1
     2,                FPMW2,NVE,NAE,NHP,HEHED,HEEFF,PKCMW,F,D,MX,MY
     3,                NHE,VBUFF
     4,                VBGIN,MBG  ,ATWEL)
C
      GO TO 300
  900 CALL EXIT
      END
// DUP
*DELETE            STRON
*STORE     WS  UA  STRON
```

หมายเหตุ โปรแกรมได้สร้างขึ้นในระหว่างการศึกษานี้

```
// JOB
// DUP
*DELETE              SIRIN
// FOR
C  SUBROUTINE SIRIN
      SUBROUTINE SIRIN(PNAME,VMAXM,VMAXG,EVAPO,VEVOL,VEELE,AEELE,AEARE
     1,                PHHED,PHCAP,MDAY,IYEAR,VMINI,LOSS,CAPMW,FPMW1
     2,                FPMW2,NVE,NAE,NHP,HEHED,HEEFF,PKCMW,F,D,MX,MY
     3,                NHE,VBUFF
     4,                VBGIN,MBG   ,ATWEL)
C
      DIMENSION PNAME(20),VMAXM(12),VMAXG(12),EVAPO(12),VEVOL(12)
     1,        VEELE(12),AEELE(12),AEARE(12),PHHED(12),PHCAP(12)
     2,        MDAY(12),VMINI(12),F(12),D(12)
     3,        HEHED(12),HEEFF(12),        VBUFF(12),CIMAG(20)
      DATA VMIN,VLOWR,DAY,VMAX,VMAXO,QFLOW,QPUMP,EVAP/8*0./
      NM=0
C
      DO 1500 IM=1,12
      M=IM
C
C  CREATE VARIABLES AT BEGINNING OF MONTH
      QEVAP=0.
      QTURB=0.
      VSHRT=0.
      DSHRT=0.
      QSPIL=0.
      AMW=0.
      PMW=0.
      VEND=0.
      IF (IM.LT. MBG) GO TO 810
      MBG=1
      NM=NM+1
      VMIN=VMINI(M)
      VLOWR=VBUFF(M)
      DAY=MDAY(M)
      VMAX=VMAXM(M)
      VMAXO=VMAXG(M)
      QFLOW=F(M)
      QPUMP=D(M)
      EVAP=EVAPO(M)
C
      EBGIN=FINDF(VBGIN,VEVOL,VEELE,NVE,MX)
      AREAB=FINDF(EBGIN,AEELE,AEARE,NAE,MX)
C
      VEND=VBGIN
C  COMPUTATION
 10   ELEND=FINDF(VEND,VEVOL,VEELE,NVE,MX)
      AREAE=FINDF(ELEND,AEELE,AEARE,NAE,MX)
      AHEAD=(EBGIN+ELEND)/2.-ATWEL
      EFCY=FINDF(AHEAD,HEHED,HEEFF,NHE,MX)
      PKCMW=FINDF(AHEAD,PHHED,PHCAP,NHP,MX)*CAPMW
      QEVAP=(AREAB+AREAE)/2.*EVAP
      BUGET=VBGIN+QFLOW-QEVAP-LOSS
      IF(BUGET.GT.VMIN) GO TO 30
C
C  RESERVOIR EMPTY
      ENDV=VMIN
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 20
      VEND=ENDV
      GO TO 10
C
 20   DSHRT=QPUMP
 25   QPUMP=QPUMP-DSHRT
      PSHRT=FPMW2
      QPOW=QMCM(FPMW2,AHEAD,EFCY,DAY)
      VSHRT=QPOW
      PMW=PKCMW
C  CALL SUBROUTINE OUTP
      GO TO 800
C
 30   VLUMP=BUGET-QPUMP
      IF(VLUMP.GT.VMIN) GO TO 100
      ENDV=VMIN
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 40
      VEND=ENDV
      GO TO 10
```

```
C
C  RESERVIOR EMPTY
 40   DSHRT=ABS(VLUMP-VMIN)
      GO TO 25
C  COMPUTE POWER (NO DIVERSION STAGE)
 100  QRUL1=VLUMP-VMAX
      IF(QRUL1.LE.0.) GO TO 200
      QPOW=QMCM(PKCMW,AHEAD,EFCY,DAY)
      SPILL=QRUL1-QPOW
      IF(SPILL.LT.0.) GO TO 120
      ENDV=VMAX
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 110
      VEND=ENDV
      GO TO 10
C
 110  QSPIL=SPILL
      QTURB=QPOW
      AMW=PKCMW
      PMW=PKCMW
C
C  CALL SUBROUTINE OUTP
      GO TO 800
C
 120  ENDV=VLUMP-QPOW
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 130
      VEND=ENDV
      GO TO 10
C
 130  AMW=PKCMW
      PMW=PKCMW
      QTURB=QPOW
C
C  CALL SUBROUTINE OUTP
      GO TO 800
C
 200  QRUL2=VLUMP-VMAXO
      IF(QRUL2.LT.0.) GO TO 300
      QPOW=QMCM(PKCMW,AHEAD,EFCY,DAY)
      VOVER=QRUL2-QPOW
      IF(VOVER.GE.0.) GO TO 120
      QPOW=QRUL2
      APWMW=P(QPOW,AHEAD,EFCY,DAY)
      IF((APWMW-FPMW1).LT.0.) GO TO 210
      ENDV=VLUMP-QPOW
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 205
      VEND=ENDV
      GO TO 10
C
 205  AMW=APWMW
      PMW=PKCMW
      QTURB=QPOW
C
C  CALL SUBROUTINE OUTP
      GO TO 800
 210  QPOW=QMCM(FPMW1,AHEAD,EFCY,DAY)
      ENDV=VLUMP-QPOW
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 220
      VEND=ENDV
      GO TO 10
C
 220  AMW=FPMW1
      PMW=PKCMW
      QTURB=QPOW
C
C  CALL SUBROUTINE OUTP
      GO TO 800
C
 300  VLOWR=VBUFF(M)
      QRUL3=VLUMP-VLOWR
      IF(QRUL3.GT.0.) GO TO 210
      QPOW=QMCM(FPMW2,AHEAD,EFCY,DAY)
      ENDV=VLUMP-QPOW
      IF((ENDV-VMIN).LT.0.) GO TO 400
      IF(ABS(VEND/ENDV-1.).LT.1.E-4) GO TO 310
      VEND=ENDV
      GO TO 10
```

```
      C
  310 AMW=FPMW2
      PMW=PKCMW
      QTURB=QPOW
      C
      C  CALL SUBROUTINE OUTP
      GO TO 800
      C  RESVIOR EMPTY
  400 ENDV=VMIN
      IF(ABS(VEND/ENDV-1.),LT.1.E-4) GO TO 410
      VEND=ENDV
      GO TO 10
      C
  410 QPOWR=VLUMP-VMIN
      APWMW=P(QPOWR,AHEAD,EFCY,DAY)
      PMW=PKCMW
      PSHRT=FPMW2-APWMW
      VSHRT=QPOW-QPOWR
      QTURB=QPOWR
      AMW=APWMW
      C
      C  CALL SUBROUTINE OUTP
  800 CURVE=FINDF(VEND,VEVOL,VEELE,NVE,MX)
      VBGIN=VEND
      PEEK=PMW
  810 CALL OUTP(CIMAG,QFLOW,QEVAP,QTURB,QPUMP,VSHRT,DSHRT,QSPIL
     1,          VEND,CURVE,VMAXO,VLOWR,AMW,PMW,FPMW1
     2,          MX,IM,DAY,IYEAR,IM)
 1500 CONTINUE
      RETURN
      END
```

```
// JOB
// DUP
*DELETE              OUTP
// FOR
C  SUBROUTINE OUTP
      SUBROUTINE OUTP(CIMAG,QFLOW,QEVAP,QTURB,QPUMP,VSHRT,DSHRT
     1,              QSPIL,VEND,CURVE,VMAXO,VLOWR,AMW,PMW,FPMW1
     2,              MX,M,DAY,IYEAR,IM)
C
      DIMENSION CIMAG(20),AMONT(12),SUM(12)
      DATA AMONT/                          'APR ','MAY ','JUN '
     1,          'JUL ','AUG ','SEP ','OCT ','NOV ','DEC '
     2,          'JAN ','FEB ','MAR '/
C
      TVSDS=VSHRT+DSHRT
      TE=AMW*DAY*24.*1.E-3
      RIVER=QTURB+QSPIL
      SE=0.
      IF(AMW.GT.FPMW1) SE=(AMW-FPMW1)*DAY*24.*1.E-3
      IF(IM.GT.1) GO TO 50
      NY=IYEAR+1900
      WRITE(MX,210) NY
      WRITE(MX,200)
      WRITE(MX,220)
      WRITE(MX,200)
C
      DO 40 I=1,12
 40   SUM(I)=0.
C
 50   WRITE(MX,230) AMONT(M),QFLOW,QEVAP,QTURB,QPUMP,VSHRT,DSHRT
     1,             TVSDS,QSPIL,RIVER,VEND,CURVE,VMAXO,VLOWR,TE
     2,             AMW,PMW
      SUM(1)=SUM(1)+QFLOW
      SUM(2)=SUM(2)+QEVAP
      SUM(3)=SUM(3)+QTURB
      SUM(4)=SUM(4)+QPUMP
      SUM(5)=SUM(5)+VSHRT
      SUM(6)=SUM(6)+DSHRT
      SUM(7)=SUM(7)+TVSDS
      SUM(8)=SUM(8)+QSPIL
      SUM(9)=SUM(9)+RIVER
C
      SUM(10)=SUM(10)+TE
      SUM(11)=SUM(11)+AMW
      SUM(12)=SUM(12)+PMW
      IF(IM.LT.12) RETURN
      WRITE(MX,200)
      WRITE(MX,250)(SUM(I),I=1,12)
      WRITE(MX,200)
      RETURN
 200  FORMAT(1X,120(1H=))
 210  FORMAT('1',///40X,'SIRINDHORN PROJECT'
     1,          //20X,'SIMULATION OF RESERVOIR OPERATION(22 YEAR'
     2,          //1X,'YEAR',I4,10X,'INSTALLED CAP. 3*12MW(WET 150,000'
     3,          'DRY 75,000 RAI) NO DOMESTIC')
 220  FORMAT(22X,'RELEASE FOR          SHORTAGE                RIVER'
     1,          '    MONTH END      TOP LEVEL          AVERAGE  CAP-'
     2,    /2X,'MON  INFLOW   EVAP  POWER    IRR  POWER    IRR  TOTAL'
     3,        '  SPILL  FLOW STORAGE  LEVEL  CONSV BUFFER ENERGY'
     4,        '  POWER BILITY'
     5,    /8X,'MCM    MCM   MCM    MCM   MCM    MCM   MCM'
     6,        '      MCM   MCM     MCM       M        M.     M     MKWH'
     7,        '   MW     MW')
 230  FORMAT(2X,A4,16F7.1)
 250  FORMAT(1X,'TOTAL',9F7.1,28X,3F7.1)
      END
```

```
// JOB
// FOR
C     FUNCTION TO FIND NUMBER OF CURVE POINTS
C
      FUNCTION NCVPT(X)
      DIMENSION X(1)
C
      NCVPT=1
      DO 200 I=2,12
      IF(X(I).GT.0.) NCVPT=NCVPT+1
  200 CONTINUE
C
      RETURN
      END
```

```
// JOB
// FOR
      FUNCTION QMCM(P,HEAD,EFCY,DAY)
      QMCM=P*DAY*86400./(HEAD*EFCY*9813.)
      RETURN
      END
```

```
// JOB
// FOR
      FUNCTION P(QMCM,HEAD,EFCY,DAY)
      P=QMCM/(DAY*86400.)*HEAD*EFCY*9813.
      RETURN
      END
```

```
// JOB
// FOR
C     FUNCTION FOR LINEAR INTERPOLATION
C
      FUNCTION FINDF(XSPEC,X,F,NPTS,MX)
C     FINDS BY LINEAR INTERPOLATION THE ORDINATE, FIND, CORRESPONDING
C     TO THE ABSCISSA, XSPEC, ON A CURVE DEFINED BY THE COORDINATES
C     F(NPTS) AND X(NPTS)
      DIMENSION F(1),X(1)
C
      IF(X(1).GT.X(NPTS))GO TO 100
      N1=1
      N2=NPTS
      GO TO 110
C
  100 N1=NPTS
      N2=1
C
  110 IF(XSPEC.LE.X(N1))GO TO 30
      IF(XSPEC.GE.X(N2))GO TO 30
      IF(N1.NE.1)GO TO 40
C
      DO 50 I=2,NPTS
      IF(XSPEC.EQ.X(I))GO TO 60
      IF(XSPEC.LT.X(I))GO TO 70
   50 CONTINUE
      GO TO 90
C
   40 DO 80 I=2,NPTS
      IF(XSPEC.EQ.X(I))GO TO 60
      IF(XSPEC.GT.X(I))GO TO 70
   80 CONTINUE
C
      GO TO 90
C
   60 FINDF=F(I)
      IF(X(I).NE.X(I+1))RETURN
      WRITE(MX,20)XSPEC,(X(I),F(I),I=1,NPTS)
      STOP
C
   70 X1=X(I)-X(I-1)
      F1=F(I)-F(I-1)
      FINDF=F(I-1)+(XSPEC-X(I-1))*F1/X1
      RETURN
C
   30 I=0
      IF(XSPEC.EQ.X(N1))I=N1
      IF(XSPEC.EQ.X(N2))I=N2
      IF(I.EQ.0)GO TO 90
      IF(I.EQ.1)GO TO 60
      FINDF=F(I)
      IF(X(I).NE.X(I-1))RETURN
C
      WRITE(MX,20)XSPEC,(X(I),F(I),I=1,NPTS)
      STOP
C
   90 WRITE(MX,10)XSPEC,(X(I),F(I),I=1,NPTS)
      STOP
C
   10 FORMAT(/5X,'FUNCTION FINDF - XSPEC IS OUTSIDE ARRAY'/21X,'XSPEC,X
     1AND F FOLLOW'/21X,F10.3,(/10F10.3))
   20 FORMAT(/5X,'FUNCTION FINDF - NO UNIQUE SOLUTION'/21X,'XSPEC, X AND
     1 F FOLLOW'/21X,F10.3,(/10F10.3))
      END
```

จ.2 ตัวอย่างข้อมูลเข้า(กรณีที่23)

```
// XEQ STRON
TITLE  TEST SIRIN   DEMAND CASE 21 + TWL 109.7  + 3*12MM.
OPTION    1900       1  1955  1978  36.0    6.0    4.5                109.7
EVAPO    .1432 .1303  .1209 .1075 .0891 .0894 .1020 .0969 .0984 .1036 .1126 .1348
VEELE     136.0 137    138.0 139.0 140.0 141.0 142.2 143.0
VEVOL     650.0 831.41000.01200.01392.61653.41966.52114.0
AEELE     136.0 137.2 138.0 139.0 140.0 141.0 142.2 143.0
AEARE     123.6 167.4 190.0 210.0 233.5 258.4 285.0 304.6
HEHED      25.0  26.2  27.0  28.0  29.0  30.0  31.2  32.0  34.0
HEEFF     0.852 0.854 0.855 0.856 0.856 0.860 0.862 0.862 0.862
PHHED      25.0  26.2  27.0  28.0  29.0  30.0  31.0  32.0  34.0
PHCAP      0.79  0.86  0.90  0.95  1.00  1.00  1.00  1.00  1.00
VMAXM   1966.51966.51966.51966.51966.51966.51966.51966.51966.51966.51966.51966.5
VMAXS   1334.81238.51219.31315.61575.21888.21966.51888.21783.81679.81575.21470.8
VBUFF   1133.51075.71064.11121.91277.71465.51512.41465.51402.91340.81277.71215.1
VMINI    831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4
FMCM  55   0.8  15.5  84.8 145.9 145.9 210.7 184.4  13.7   4.3   1.6   0.7   0.5
DMCM  55   6.6   1.3  20.9  29.6  22.3  27.9  42.7   9.9  29.3  47.4  38.3  41.0
FMCM  56   0.5  59.7 147.0 209.1 272.9 440.6 167.6  21.5   7.0   2.7   1.0   0.8
DMCM  56   3.2   1.1  24.6  27.7  24.6  20.1  27.6  10.6  29.3  47.4  43.8  23.2
FMCM  57   0.8  18.2  63.0 140.8 356.7 482.1 314.4  40.7  12.8   4.3   1.7   0.8
DMCM  57   3.7   1.5  23.2  36.2  17.7  20.1  36.2  11.7  29.3  47.4  44.4  52.2
FMCM  58   0.8   7.0  52.6 125.3 293.8 461.4 146.8  20.2   6.2   2.7   1.0   0.8
DMCM  58  12.7   1.5  24.4  29.0  17.7  21.9  39.1   9.9  29.3  47.4  44.4  51.2
FMCM  59   0.8  18.2  21.5 145.9 252.3 482.1 126.1  16.3   5.1   1.6   0.7   0.8
DMCM  59   4.5   1.5  24.9  42.1  27.8  25.6  26.4  11.7  29.3  47.4  44.4  49.4
FMCM  60   0.5  18.5  63.0 104.4 126.1 419.1 189.1  24.6   8.6   2.1   0.7   0.5
DMCM  60   9.6   1.3  25.5  31.9  20.6  23.8  21.6   9.4  29.3  47.4  44.4  45.4
FMCM  61   0.3  14.5  57.8 240.2 427.1 426.1 369.8  44.3  13.1   4.5   1.4   1.3
DMCM  61  10.3   1.2  23.6  27.7  17.7  24.1  17.8  11.7  29.3  47.4  19.5  50.4
FMCM  62   4.7  32.4 201.1 389.6 555.7 706.1 217.4  26.7  10.7   4.0   1.7   1.1
DMCM  62  10.1   1.1  21.9  28.3  17.7  20.1  26.2  11.7  29.3  47.4  44.4  47.2
FMCM  63   0.5   5.4  29.3 137.4 348.7 442.4 311.2  42.0  11.8   3.5   1.4   0.5
DMCM  63  12.5   1.6  25.0  38.9  20.7  25.9  18.5   4.3  29.3  47.4  44.4  30.2
FMCM  64   1.0  69.6  44.6  49.0 262.0 357.7 197.4  24.1   9.9   2.9   1.4   0.8
DMCM  64  12.0   1.1  24.6  28.2  20.1  20.1  17.7   2.9  29.3  47.4  43.6  48.9
FMCM  65   3.4   6.2 254.0 270.5 324.0 318.8 101.0  16.8   6.2   2.9   1.0   0.8
DMCM  65   3.2   1.1  20.9  31.3  19.9  21.8  41.3  11.4  29.3  47.4  42.8  28.9
FMCM  66   1.6 136.3  76.5 393.7 479.4 467.3  65.9  27.7  13.1   4.8   1.9   1.1
DMCM  66   3.5   1.1  20.9  32.0  17.7  23.4  26.7  11.7  29.3  47.4  44.4  52.2
FMCM  67   4.9   5.1  69.7 167.4 279.5 401.8 222.3  38.4  12.3   3.5   2.9   2.0
DMCM  67   3.2   1.3  24.7  27.7  17.7  20.1  21.8   7.7  29.3  47.4  44.4  51.6
FMCM  68   0.4  11.3  31.1  50.4 687.0 677.0  91.2  24.4   9.7   4.5   2.0   0.9
DMCM  68   3.2   1.3  28.9  28.1  17.7  20.1  26.9  11.7  29.3  47.3  41.3  45.6
FMCM  69   0.6  20.2  76.3 321.0 248.0 312.0 126.0  38.8  11.4   5.3   2.3   0.6
DMCM  69   5.7   1.1  24.6  27.7  23.2  24.3  22.0  11.7  29.3  47.4  44.4  52.2
FMCM  70   1.4  12.8 185.9 222.1 460.8 257.5 125.1   9.2  40.4   8.9  11.6  12.5
DMCM  70   4.7   1.3  20.9  31.6  17.7  34.0  39.3  11.7  29.3  47.4  44.4  52.2
FMCM  71  20.4  47.5 192.3 336.8 283.4 430.3 179.7  13.5  16.7   0.4  16.4   8.3
DMCM  71   6.6   1.4  23.4  28.0  21.3  26.7  40.3  11.7  29.3  47.4  25.5  32.4
FMCM  72  26.0  10.1 704.8 586.2 351.6 838.4 319.5  84.2  36.8   0.0   0.0   0.0
DMCM  72   8.0   1.5  20.9  27.7  17.8  20.1  21.6   2.9  26.7  44.9  44.4  47.6
FMCM  73   0.3  44.7  57.9 178.2 204.8 283.8  37.3   4.4  10.4  16.3   2.2   9.1
DMCM  73   5.0   1.3  25.1  27.7  17.7  21.4  28.5  11.4  29.3  47.2  41.8  50.4
FMCM  74  72.2  87.0 107.8 108.0 483.7 211.8 180.0  94.8  22.7   2.6   0.0  12.2
DMCM  74   3.2   1.2  22.7  30.1  17.7  23.5  26.2   3.8  28.9  45.4  33.1  51.0
FMCM  75  20.0 115.4 320.6 247.1 544.1 484.5 238.8  41.2  16.8  13.2  14.7  29.2
DMCM  75   4.8   1.1  20.9  27.7  17.7  20.1  18.0   2.9  29.2  47.4  44.4  47.4
FMCM  76  27.9  62.2  75.0 157.1 285.5 348.2 171.0  44.0  20.2  16.4   1.1  10.3
DMCM  76   5.7   1.1  22.5  27.7  17.7  21.1  17.7   6.9  27.9  47.4  44.4  34.7
FMCM  77  12.5  19.8  10.5  94.7 312.1 569.9  82.8   7.9   4.5   1.2   6.7  17.5
DMCM  77   4.1   1.7  26.6  28.3  19.4  20.1  44.9  11.4  29.3  47.4  44.4  45.7
FMCM  78  21.3  41.3  92.2 306.3 798.9 520.7 202.6  33.7   2.0   8.8   8.1   8.4
DMCM  78   3.2   1.3  21.1  29.4  17.7  20.1  27.3   6.3  29.3  47.4  44.4  52.2
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๗.3 ตัวอย่างข้อมูลออก(กรณี23)

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PAGE   1

// JOB

LOG DRIVE   CART SPEC   CART AVAIL  PHY DRIVE
  0000        0007        0007        0000

V2 M11   ACTUAL  8K  CONFIG  8K

// XEQ STRON

TITLE  TEST SIRIN   DEMAND CASE 21 + TWL 109.7  & 3*12MW.
OPTION    1900     1  1955  1978  36.0   6.0   4.5                109.7
EVAPO    .1432 .1303 .1209 .1075 .0891 .0894 .1020 .0969 .0984 .1036 .1126 .1348
VEELE    136.0 137.2 138.0 139.0 140.0 141.0 142.2 143.0
VEVOL    650.0 831.41000.01200.01392.61653.41966.52114.0
AEELE    136.0 137.2 138.0 139.0 140.0 141.0 142.2 143.0
AEARE    123.6 167.4 190.0 210.0 233.5 258.4 288.0 304.6
HEHED     25.0  26.2  27.0  28.0  29.0  30.0  31.2  32.0  34.0
HEEFF    0.852 0.854 0.855 0.856 0.856 0.860 0.862 0.862 0.862
PHHED     25.0  26.2  27.0  28.0  29.0  30.0  31.0  32.0  34.0
PHCAP     0.79  0.86  0.90  0.95  1.00  1.00  1.00  1.00  1.00
VMAXM   1966.51966.51966.51966.51966.51966.51966.51966.51966.51966.51966.5
VMAXG   1334.81238.51219.31315.61575.21888.21966.51888.21783.81679.51575.21470.8
VBUFF   1133.51075.71064.11121.91277.71465.51512.41465.51402.91340.31277.71215.1
VMINI    831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4 831.4
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SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1955

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.8	37.6	350.3	6.6	0.0	0.0	0.0	0.0	350.3	1506.3	140.4	1334.8	1138.5	25.9	36.0	36.0
MAY	15.5	29.9	252.0	1.3	0.0	0.0	0.0	0.0	252.0	1238.5	139.1	1238.5	1075.7	17.8	26.4	36.0
JUN	84.8	25.7	62.7	20.9	0.0	0.0	-0.0	0.0	62.7	1213.8	139.0	1219.3	1064.1	4.3	6.0	36.0
JUL	145.9	22.9	64.8	29.6	0.0	0.0	0.0	0.0	64.8	1242.3	139.2	1315.6	1121.9	4.4	6.0	36.0
AUG	145.9	19.3	64.3	22.3	0.0	0.0	0.0	0.0	64.3	1282.1	139.4	1575.2	1277.7	4.4	6.0	36.0
SEP	210.7	20.2	46.0	27.9	0.0	0.0	0.0	0.0	46.0	1398.7	140.0	1888.2	1465.5	3.2	4.5	36.0
OCT	184.4	24.1	62.5	42.7	0.0	0.0	0.0	0.0	62.5	1453.7	140.2	1966.5	1512.4	4.4	6.0	36.0
NOV	13.7	22.8	45.4	9.9	0.0	0.0	0.0	0.0	45.4	1389.1	139.9	1888.2	1465.5	3.2	4.5	36.0
DEC	4.3	22.3	47.5	29.3	0.0	0.0	0.0	0.0	47.5	1294.2	139.4	1783.8	1402.9	3.3	4.5	36.0
JAN	1.6	22.2	48.5	47.4	0.0	0.0	0.0	0.0	48.5	1177.6	138.8	1679.5	1340.3	3.3	4.5	36.0
FEB	0.7	22.8	44.8	38.3	0.0	0.0	0.0	0.0	44.8	1072.4	138.3	1575.2	1277.7	3.0	4.5	35.8
MAR	0.5	25.6	50.5	41.0	0.0	0.0	0.0	0.0	50.5	955.6	137.7	1470.8	1215.1	3.3	4.5	34.8
TOTAL	809.7	296.1	1139.8	317.1	0.0	0.0	0.0	0.0	1139.8					80.9	113.4	430.7

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1956

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.5	25.6	49.7	3.2	0.0	0.0	0.0	0.0	49.7	877.6	137.4	1334.8	1133.5	3.2	4.5	34.0
MAY	59.7	22.5	48.4	1.1	0.0	0.0	0.0	0.0	48.4	865.1	137.3	1238.5	1075.7	3.1	4.5	33.6
JUN	147.0	21.2	49.9	24.6	0.0	0.0	0.0	0.0	49.9	916.3	137.6	1219.3	1064.1	3.2	4.5	33.8
JUL	209.1	19.9	50.9	27.7	0.0	0.0	0.0	0.0	50.9	1026.3	138.1	1315.6	1121.9	3.3	4.5	34.5
AUG	272.9	17.9	49.6	24.6	0.0	0.0	0.0	0.0	49.6	1207.5	139.0	1575.2	1277.7	3.3	4.5	35.7
SEP	440.6	20.5	61.1	20.1	0.0	0.0	0.0	0.0	61.1	1546.3	140.5	1888.2	1465.5	4.3	6.0	36.0
OCT	167.6	25.5	61.3	27.6	0.0	0.0	0.0	0.0	61.3	1599.4	140.7	1966.5	1512.4	4.4	6.0	36.0
NOV	21.5	24.2	59.4	10.6	0.0	0.0	0.0	0.0	59.4	1526.6	140.5	1888.2	1465.5	4.3	6.0	36.0
DEC	7.0	23.7	62.1	29.3	0.0	0.0	0.0	0.0	62.1	1418.4	140.0	1783.8	1402.9	4.4	6.0	36.0
JAN	2.7	23.6	63.3	47.4	0.0	0.0	0.0	0.0	63.3	1286.7	139.4	1679.5	1340.3	4.4	6.0	36.0
FEB	1.0	24.1	43.8	43.8	0.0	0.0	0.0	0.0	43.8	1175.9	138.8	1575.2	1277.7	3.0	4.5	36.0
MAR	0.8	27.3	49.5	23.2	0.0	0.0	0.0	0.0	49.5	1076.5	138.3	1470.8	1215.1	3.3	4.5	35.3
TOTAL	1330.3	276.3	649.7	283.1	0.0	0.0	0.0	0.0	649.7					44.7	61.5	423.6

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1957

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.8	27.7	49.7	3.7	0.0	0.0	0.0	0.0	48.7	997.2	137.9	1334.8	1133.5	3.2	4.5	35.0
MAY	18.2	24.2	46.0	1.8	0.0	0.0	0.0	0.0	46.0	943.3	137.7	1238.5	1075.7	3.0	4.5	34.4
JUN	63.0	21.7	49.6	23.2	0.0	0.0	0.0	0.0	49.6	911.6	137.5	1219.3	1064.1	3.2	4.5	34.1
JUL	146.8	19.4	51.2	36.2	0.0	0.0	0.0	0.0	51.2	951.5	137.7	1315.6	1121.9	3.3	4.5	34.1
AUG	356.7	17.6	49.9	17.7	0.0	0.0	0.0	0.0	49.9	1223.0	139.1	1575.2	1277.7	3.3	4.5	35.5
SEP	482.1	20.8	60.8	20.1	0.0	0.0	0.0	0.0	60.8	1603.2	140.8	1888.2	1465.5	4.3	6.0	36.0
OCT	314.4	26.7	60.3	36.2	0.0	0.0	0.0	0.0	60.3	1794.2	141.5	1966.5	1512.4	4.4	6.0	36.0
NOV	40.7	26.0	57.9	11.7	0.0	0.0	0.0	0.0	57.9	1739.2	141.3	1888.2	1465.5	4.3	6.0	36.0
DEC	12.8	25.7	60.4	29.3	0.0	0.0	0.0	0.0	60.4	1636.4	140.9	1783.8	1402.9	4.4	6.0	36.0
JAN	4.3	25.9	61.3	47.4	0.0	0.0	0.0	0.0	61.3	1505.9	140.4	1679.5	1340.3	4.4	6.0	36.0
FEB	1.7	26.8	56.3	44.4	0.0	0.0	0.0	0.0	56.3	1380.0	139.9	1575.2	1277.7	4.0	6.0	36.0
MAR	0.8	30.0	63.8	52.2	0.0	0.0	0.0	0.0	63.8	1234.7	139.1	1470.8	1215.1	4.4	6.0	36.0
TOTAL	1442.2	293.1	666.7	323.8	0.0	0.0	0.0	0.0	666.7					46.7	64.5	425.3

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1958

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.8	29.8	63.3	12.7	0.0	0.0	0.0	0.0	63.3	1129.6	138.6	1334.8	1133.5	4.3	6.0	36.0
MAY	7.0	25.9	60.1	1.5	0.0	0.0	0.0	0.0	60.1	1049.1	138.2	1238.5	1075.7	4.0	6.0	35.5
JUN	52.6	23.2	48.8	24.4	0.0	0.0	0.0	0.0	48.8	1005.1	138.0	1219.3	1064.1	3.2	4.5	34.9
JUL	125.3	20.6	50.5	29.0	0.0	0.0	0.0	0.0	50.5	1030.2	138.1	1315.6	1121.9	3.3	4.5	34.8
AUG	293.8	18.0	66.1	17.7	0.0	0.0	0.0	0.0	66.1	1222.1	139.1	1575.2	1277.7	4.4	6.0	35.8
SEP	461.4	20.7	60.9	21.9	0.0	0.0	0.0	0.0	60.9	1579.8	140.7	1888.2	1465.5	4.3	6.0	36.0
OCT	146.8	25.7	61.1	39.1	0.0	0.0	0.0	0.0	61.1	1600.6	140.7	1966.5	1512.4	4.4	6.0	36.0
NOV	20.2	24.2	59.4	9.9	0.0	0.0	0.0	0.0	59.4	1527.2	140.5	1888.2	1465.5	4.3	6.0	36.0
DEC	6.2	23.7	62.1	29.3	0.0	0.0	0.0	0.0	62.1	1418.1	140.0	1783.8	1402.9	4.4	6.0	36.0
JAN	2.7	23.6	63.3	47.4	0.0	0.0	0.0	0.0	63.3	1286.4	139.4	1679.5	1340.3	4.4	6.0	36.0
FEB	1.0	24.0	43.8	44.4	0.0	0.0	0.0	0.0	43.8	1175.0	138.8	1575.2	1277.7	3.0	4.5	36.0
MAR	0.8	27.1	49.7	51.2	0.0	0.0	0.0	0.0	49.7	1047.8	138.2	1470.8	1215.1	3.3	4.5	35.7
TOTAL	1118.5	287.0	689.6	328.4	0.0	0.0	0.0	0.0	689.5					47.8	66.0	429.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1959

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.8	27.2	48.9	4.5	0.0	0.0	0.0	0.0	48.9	967.8	137.8	1334.8	1133.5	3.2	4.5	34.8
MAY	18.2	23.7	46.2	1.5	0.0	0.0	0.0	0.0	46.2	914.6	137.5	1238.5	1075.7	3.0	4.5	34.2
JUN	21.5	20.9	50.1	24.9	0.0	0.0	0.0	0.0	50.1	840.1	137.2	1219.3	1064.1	3.2	4.5	33.6
JUL	145.9	18.3	51.9	42.1	0.0	0.0	0.0	0.0	51.9	873.6	137.4	1315.6	1121.9	3.3	4.5	33.5
AUG	252.3	16.3	51.1	27.8	0.0	0.0	0.0	0.0	51.1	1030.7	138.1	1575.2	1277.7	3.3	4.5	34.3
SEP	482.1	19.1	62.8	25.6	0.0	0.0	0.0	0.0	62.8	1405.2	140.0	1888.2	1465.5	4.3	6.0	36.0
OCT	126.1	24.0	46.9	26.4	0.0	0.0	0.0	0.0	46.9	1434.0	140.1	1966.5	1512.4	3.3	4.5	36.0
NOV	16.3	22.6	45.5	11.7	0.0	0.0	0.0	0.0	45.5	1370.2	139.8	1888.2	1465.5	3.2	4.5	36.0
DEC	5.1	22.1	47.7	29.3	0.0	0.0	0.0	0.0	47.7	1276.2	139.3	1783.8	1402.9	3.3	4.5	36.0
JAN	1.6	22.0	48.7	47.4	0.0	0.0	0.0	0.0	48.7	1159.6	138.7	1679.5	1340.3	3.3	4.5	36.0
FEB	0.7	22.5	44.9	44.4	0.0	0.0	0.0	0.0	44.9	1048.4	138.2	1575.2	1277.7	3.0	4.5	35.6
MAR	0.8	25.2	50.8	49.4	0.0	0.0	0.0	0.0	50.8	923.7	137.6	1470.8	1215.1	3.3	4.5	34.6
TOTAL	1071.3	264.5	595.9	334.9	0.0	0.0	0.0	0.0	595.9					40.1	55.5	420.9

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1960

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.5	24.9	50.0	9.6	0.0	0.0	0.0	0.0	50.0	839.6	137.2	1334.8	1133.5	3.2	4.5	33.7
MAY	18.5	21.8	3.5	1.3	45.2	0.0	45.2	0.0	3.5	831.4	137.2	1238.5	1075.7	0.2	0.3	33.3
JUN	63.0	20.2	17.2	25.5	33.2	0.0	33.2	0.0	17.2	831.4	137.2	1219.3	1064.1	1.1	1.5	33.2
JUL	104.4	18.0	52.1	31.9	0.0	0.0	0.0	0.0	52.1	833.6	137.2	1315.6	1121.9	3.3	4.5	33.3
AUG	126.1	15.1	52.0	20.6	0.0	0.0	0.0	0.0	52.0	872.0	137.3	1575.2	1277.7	3.3	4.5	33.4
SEP	419.1	17.1	48.7	23.8	0.0	0.0	0.0	0.0	48.7	1201.5	139.0	1888.2	1465.5	3.2	4.5	35.1
OCT	189.1	22.0	48.4	21.6	0.0	0.0	0.0	0.0	48.4	1298.5	139.5	1966.5	1512.4	3.3	4.5	36.0
NOV	24.6	21.2	46.6	9.4	0.0	0.0	0.0	0.0	46.6	1245.8	139.2	1888.2	1465.5	3.2	4.5	36.0
DEC	8.6	20.7	48.8	29.3	0.0	0.0	0.0	0.0	48.8	1155.4	138.7	1783.8	1402.9	3.3	4.5	36.0
JAN	2.1	20.6	49.8	47.4	0.0	0.0	0.0	0.0	49.8	1039.5	138.1	1679.5	1340.3	3.3	4.5	35.6
FEB	0.7	21.0	45.9	44.4	0.0	0.0	0.0	0.0	45.9	928.8	137.6	1575.2	1277.7	3.0	4.5	34.6
MAR	0.5	23.4	29.1	45.4	22.6	0.0	22.6	0.0	29.1	831.4	137.2	1470.8	1215.1	1.8	2.5	33.7
TOTAL	957.1	246.5	492.6	310.1	101.1	0.0	101.1	0.0	492.6					32.7	44.8	414.2

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1961

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.3	23.9	0.0	0.0	50.5	10.3	60.8	0.0	0.0	831.4	137.2	1334.8	1133.5	0.0	0.0	33.2
MAY	14.5	21.8	0.0	0.0	47.1	1.2	48.3	0.0	0.0	831.4	137.2	1238.5	1075.7	0.0	0.0	33.2
JUN	57.8	20.2	13.9	23.6	36.5	0.0	36.5	0.0	13.9	831.4	137.2	1219.3	1064.1	0.8	1.2	33.2
JUL	240.2	19.0	51.5	27.7	0.0	0.0	0.0	0.0	51.5	973.3	137.8	1315.6	1121.9	3.3	4.5	33.9
AUG	427.1	18.1	65.9	17.7	0.0	0.0	0.0	0.0	65.9	1298.5	139.5	1575.2	1277.7	4.4	6.0	35.9
SEP	426.1	21.3	60.3	24.1	0.0	0.0	0.0	0.0	60.3	1618.8	140.8	1888.2	1465.5	4.3	6.0	36.0
OCT	369.8	27.2	59.9	17.8	0.0	0.0	0.0	0.0	59.9	1883.5	141.8	1966.5	1512.4	4.4	6.0	36.0
NOV	44.3	26.9	57.3	11.7	0.0	0.0	0.0	0.0	57.3	1831.8	141.6	1888.2	1465.5	4.3	6.0	36.0
DEC	13.1	26.6	59.7	29.3	0.0	0.0	0.0	0.0	59.7	1729.1	141.2	1783.8	1402.9	4.4	6.0	36.0
JAN	4.5	26.8	60.6	47.4	0.0	0.0	0.0	0.0	60.6	1598.7	140.7	1679.5	1340.3	4.4	6.0	36.0
FEB	1.4	27.9	55.5	19.5	0.0	0.0	0.0	0.0	55.5	1497.1	140.4	1575.2	1277.7	4.0	6.0	36.0
MAR	1.3	31.8	62.5	50.4	0.0	0.0	0.0	0.0	62.5	1353.6	139.7	1470.8	1215.1	4.4	6.0	36.0
TOTAL	1600.3	292.0	547.7	269.1	134.2	11.5	145.7	0.0	547.7					39.2	53.7	421.7

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1962

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	4.7	31.8	61.8	10.1	0.0	0.0	0.0	0.0	61.8	1254.5	139.2	1334.8	1133.5	4.3	6.0	36.0
MAY	32.4	27.7	58.5	1.1	0.0	0.0	0.0	0.0	58.5	1199.3	138.9	1238.5	1075.7	4.0	6.0	36.0
JUN	201.1	25.5	133.7	21.9	0.0	0.0	0.0	0.0	133.7	1219.3	139.1	1219.3	1064.1	9.1	12.7	36.0
JUL	389.6	23.4	241.5	28.3	0.0	0.0	0.0	0.0	241.5	1315.6	139.6	1315.6	1121.9	16.7	22.5	36.0
AUG	555.7	21.1	257.2	17.7	0.0	0.0	0.0	0.0	257.2	1575.2	140.7	1575.2	1277.7	18.3	24.7	36.0
SEP	708.1	23.7	349.0	20.1	0.0	0.0	0.0	0.0	349.0	1890.2	141.9	1888.2	1465.5	25.9	36.0	36.0
OCT	217.4	27.7	358.0	26.2	0.0	0.0	0.0	0.0	358.0	1695.7	141.1	1966.5	1512.4	26.7	36.0	36.0
NOV	26.7	25.1	58.6	11.7	0.0	0.0	0.0	0.0	58.6	1626.9	140.8	1888.2	1465.5	4.3	6.0	36.0
DEC	10.7	24.6	61.3	29.3	0.0	0.0	0.0	0.0	61.3	1522.2	140.4	1783.8	1402.9	4.4	6.0	36.0
JAN	4.0	24.8	62.2	47.4	0.0	0.0	0.0	0.0	62.2	1391.6	139.9	1679.5	1340.3	4.4	6.0	36.0
FEB	1.7	25.4	57.4	44.4	0.0	0.0	0.0	0.0	57.4	1266.1	139.3	1575.2	1277.7	4.0	6.0	36.0
MAR	1.1	28.4	48.8	47.2	0.0	0.0	0.0	0.0	48.8	1142.6	138.7	1470.8	1215.1	3.3	4.5	36.0
TOTAL	2153.1	309.8	1748.5	305.3	0.0	0.0	0.0	0.0	1748.5					125.9	172.4	432.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1963

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.5	28.6	48.2	12.5	0.0	0.0	0.0	0.0	48.2	1053.8	138.2	1334.8	1133.5	3.2	4.5	35.6
MAY	5.4	24.9	45.6	1.6	0.0	0.0	0.0	0.0	45.6	987.0	137.9	1238.5	1075.7	3.0	4.5	34.9
JUN	29.3	22.2	49.4	25.0	0.0	0.0	0.0	0.0	49.4	919.6	137.6	1219.3	1064.1	3.2	4.5	34.3
JUL	137.4	19.4	51.2	38.9	0.0	0.0	0.0	0.0	51.2	947.4	137.7	1315.6	1121.9	3.3	4.5	34.1
AUG	348.7	17.5	50.0	20.7	0.0	0.0	0.0	0.0	50.0	1208.0	139.0	1575.2	1277.7	3.3	4.5	35.4
SEP	442.4	20.5	61.1	25.9	0.0	0.0	0.0	0.0	61.1	1542.8	140.5	1888.2	1465.5	4.3	6.0	36.0
OCT	311.2	26.2	60.7	18.5	0.0	0.0	0.0	0.0	60.7	1748.5	141.3	1966.5	1512.4	4.4	6.0	36.0
NOV	42.0	25.6	58.2	4.3	0.0	0.0	0.0	0.0	58.2	1702.2	141.1	1888.2	1465.5	4.3	6.0	36.0
DEC	11.8	25.3	60.7	29.3	0.0	0.0	0.0	0.0	60.7	1598.5	140.7	1783.8	1402.9	4.4	6.0	36.0
JAN	3.5	25.5	61.6	47.4	0.0	0.0	0.0	0.0	61.6	1467.2	140.2	1679.5	1340.3	4.4	6.0	36.0
FEB	1.4	26.3	56.7	44.4	0.0	0.0	0.0	0.0	56.7	1341.2	139.7	1575.2	1277.7	4.0	6.0	36.0
MAR	0.5	29.6	64.1	30.2	0.0	0.0	0.0	0.0	64.1	1217.7	139.0	1470.8	1215.1	4.4	6.0	36.0
TOTAL	1334.0	292.2	668.0	298.6	0.0	0.0	0.0	0.0	668.0					45.7	64.5	426.5

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1964

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	1.0	29.6	63.5	12.0	0.0	0.0	0.0	0.0	63.5	1113.5	138.5	1334.8	1133.5	4.3	6.0	36.0
MAY	69.6	26.1	62.1	1.1	0.0	0.0	0.0	0.0	62.1	1093.8	138.4	1238.5	1075.7	4.1	6.0	35.6
JUN	44.6	23.6	64.7	24.6	0.0	0.0	0.0	0.0	64.7	1025.3	138.1	1219.3	1064.1	4.3	6.0	35.2
JUL	49.0	20.3	50.6	28.2	0.0	0.0	0.0	0.0	50.6	975.1	137.8	1315.6	1121.9	3.3	4.5	34.7
AUG	263.0	17.4	50.1	20.1	0.0	0.0	0.0	0.0	50.1	1150.4	138.7	1575.2	1277.7	3.3	4.5	35.3
SEP	357.7	19.6	62.1	20.1	0.0	0.0	0.0	0.0	62.1	1406.2	140.0	1888.2	1465.5	4.3	6.0	36.0
OCT	197.4	24.4	62.3	17.7	0.0	0.0	0.0	0.0	62.3	1499.3	140.4	1966.5	1512.4	4.4	6.0	36.0
NOV	24.1	23.3	60.1	2.9	0.0	0.0	0.0	0.0	60.1	1436.9	140.1	1888.2	1465.5	4.3	6.0	36.0
DEC	9.9	22.9	47.1	29.3	0.0	0.0	0.0	0.0	47.1	1347.5	139.7	1783.8	1402.9	3.3	4.5	36.0
JAN	2.9	22.8	48.0	47.4	0.0	0.0	0.0	0.0	48.0	1232.0	139.1	1679.5	1340.3	3.3	4.5	36.0
FEB	1.4	23.4	44.3	43.6	0.0	0.0	0.0	0.0	44.3	1122.1	138.6	1575.2	1277.7	3.0	4.5	36.0
MAR	0.8	26.4	50.1	48.9	0.0	0.0	0.0	0.0	50.1	997.4	137.9	1470.8	1215.1	3.3	4.5	35.2
TOTAL	1021.3	280.2	665.5	295.8	0.0	0.0	0.0	0.0	665.5					45.6	63.0	428.2

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1965

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	3.4	26.4	49.4	3.2	0.0	0.0	0.0	0.0	49.4	921.7	137.6	1334.8	1133.5	3.2	4.5	34.3
MAY	5.2	22.8	46.5	1.1	0.0	0.0	0.0	0.0	46.6	857.3	137.3	1238.5	1075.7	3.0	4.5	33.7
JUN	254.0	21.8	66.2	20.9	0.0	0.0	0.0	0.0	66.2	1002.4	138.0	1219.3	1064.1	4.3	6.0	34.1
JUL	270.5	21.2	66.6	31.3	0.0	0.0	0.0	0.0	66.6	1153.6	138.7	1315.6	1121.9	4.4	6.0	35.4
AUG	324.0	19.4	64.3	19.9	0.0	0.0	0.0	0.0	64.3	1378.9	139.9	1575.2	1277.7	4.4	6.0	36.0
SEP	318.9	21.6	60.0	21.9	0.0	0.0	0.0	0.0	60.0	1589.2	140.7	1888.2	1465.5	4.3	6.0	36.0
OCT	101.0	25.5	61.3	41.3	0.0	0.0	0.0	0.0	61.3	1562.0	140.6	1966.5	1512.4	4.4	6.0	36.0
NOV	16.9	23.8	59.7	11.4	0.0	0.0	0.0	0.0	59.7	1483.8	140.3	1888.2	1465.5	4.3	6.0	36.0
DEC	6.2	23.2	62.5	29.3	0.0	0.0	0.0	0.0	62.5	1374.8	139.9	1783.8	1402.9	4.4	6.0	36.0
JAN	2.9	23.2	47.7	47.4	0.0	0.0	0.0	0.0	47.7	1259.3	139.3	1679.5	1340.3	3.3	4.5	36.0
FEB	1.0	23.7	44.1	42.8	0.0	0.0	0.0	0.0	44.1	1149.6	138.7	1575.2	1277.7	3.0	4.5	36.0
MAR	0.8	26.9	49.8	28.9	0.0	0.0	0.0	0.0	49.8	1044.7	138.2	1470.8	1215.1	3.3	4.5	35.6
TOTAL	1305.5	280.0	678.7	299.2	0.0	0.0	0.0	0.0	678.7					46.7	64.5	425.3

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1966

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	1.6	27.2	49.0	5.5	0.0	0.0	0.0	0.0	49.0	966.6	137.8	1334.8	1133.5	3.2	4.5	34.7
MAY	136.3	24.5	61.1	1.1	0.0	0.0	0.0	0.0	61.1	1016.1	138.0	1238.5	1075.7	4.0	6.0	34.6
JUN	76.5	23.0	48.9	20.9	0.0	0.0	0.0	0.0	48.9	999.6	137.9	1219.3	1064.1	3.2	4.5	34.8
JUL	393.7	21.9	65.9	32.0	0.0	0.0	0.0	0.0	65.9	1273.2	139.3	1315.6	1121.9	4.4	6.0	35.9
AUG	479.4	20.9	138.8	17.7	0.0	0.0	0.0	0.0	138.8	1575.2	140.7	1575.2	1277.7	9.8	13.2	36.0
SEP	487.3	22.8	353.9	23.4	0.0	0.0	0.0	0.0	353.9	1662.3	141.0	1888.2	1465.5	25.9	36.0	36.0
OCT	65.9	26.2	60.8	26.7	0.0	0.0	0.0	0.0	60.8	1614.4	140.8	1966.5	1512.4	4.4	6.0	36.0
NOV	27.7	24.3	59.2	11.7	0.0	0.0	0.0	0.0	59.2	1546.7	140.5	1888.2	1465.5	4.3	6.0	36.0
DEC	13.1	23.9	61.9	29.3	0.0	0.0	0.0	0.0	61.9	1444.5	140.1	1783.8	1402.9	4.4	6.0	36.0
JAN	4.8	23.9	63.0	47.4	0.0	0.0	0.0	0.0	63.0	1314.8	139.5	1679.5	1340.3	4.4	6.0	36.0
FEB	1.9	24.4	43.6	44.4	0.0	0.0	0.0	0.0	43.6	1204.2	139.0	1575.2	1277.7	3.0	4.5	36.0
MAR	1.1	27.5	49.4	52.2	0.0	0.0	0.0	0.0	49.4	1076.1	138.3	1470.8	1215.1	3.3	4.5	36.0
TOTAL	1689.2	291.0	1056.1	310.2	0.0	0.0	0.0	0.0	1056.1					74.8	103.2	428.2

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1967

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	4.9	27.7	48.7	3.2	0.0	0.0	0.0	0.0	48.7	1001.3	139.0	1334.8	1133.5	3.2	4.5	35.0
MAY	5.1	24.1	46.0	1.3	0.0	0.0	0.0	0.0	46.0	934.9	137.6	1238.5	1075.7	3.0	4.5	34.4
JUN	69.7	21.7	49.7	24.7	0.0	0.0	0.0	0.0	49.7	908.5	137.5	1219.3	1064.1	3.2	4.5	34.0
JUL	167.4	19.6	51.1	27.7	0.0	0.0	0.0	0.0	51.1	977.4	137.8	1315.6	1121.9	3.3	4.5	34.2
AUG	278.5	17.5	50.0	17.7	0.0	0.0	0.0	0.0	50.0	1170.6	138.8	1575.2	1277.7	3.3	4.5	35.4
SEP	401.8	20.0	61.7	20.1	0.0	0.0	0.0	0.0	61.7	1470.6	140.2	1888.2	1465.5	4.3	6.0	36.0
OCT	222.3	25.1	61.6	21.8	0.0	0.0	0.0	0.0	61.6	1584.3	140.7	1966.5	1512.4	4.4	6.0	36.0
NOV	36.4	24.1	59.4	7.7	0.0	0.0	0.0	0.0	59.4	1531.4	140.5	1888.2	1465.5	4.3	6.0	36.0
DEC	12.3	23.7	62.0	29.3	0.0	0.0	0.0	0.0	62.0	1428.4	140.1	1783.8	1402.9	4.4	6.0	36.0
JAN	3.5	23.7	63.2	47.4	0.0	0.0	0.0	0.0	63.2	1297.5	139.5	1679.5	1340.3	4.4	6.0	36.0
FEB	2.0	24.2	43.7	44.4	0.0	0.0	0.0	0.0	43.7	1187.9	138.9	1575.2	1277.7	3.0	4.5	36.0
MAR	2.0	27.2	49.6	51.6	0.0	0.0	0.0	0.0	49.6	1061.4	138.3	1470.8	1215.1	3.3	4.5	35.8
TOTAL	1209.7	279.2	647.2	296.8	0.0	0.0	0.0	0.0	647.2					44.6	61.5	425.1

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1968

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.4	27.4	48.8	3.2	0.0	0.0	0.0	0.0	48.8	982.3	137.9	1334.8	1133.5	3.2	4.5	34.9
MAY	11.3	23.9	47.8	1.3	0.0	0.0	0.0	0.0	47.8	920.6	137.6	1238.5	1075.7	3.1	4.5	34.3
JUN	31.1	21.1	50.0	28.9	0.0	0.0	0.0	0.0	50.0	851.6	137.2	1219.3	1064.1	3.2	4.5	33.7
JUL	50.4	18.1	24.4	28.1	27.7	0.0	27.7	0.0	24.4	831.4	137.2	1315.6	1121.9	1.5	2.1	33.3
AUG	667.0	17.9	66.0	17.7	0.0	0.0	0.0	0.0	66.0	1416.6	140.0	1575.2	1277.7	4.4	6.0	35.9
SEP	677.0	22.2	356.9	20.1	0.0	0.0	0.0	0.0	356.9	1694.2	141.1	1888.2	1465.5	25.9	36.0	36.0
OCT	91.2	26.6	60.4	26.9	0.0	0.0	0.0	0.0	60.4	1671.4	141.0	1966.5	1512.4	4.4	6.0	36.0
NOV	24.4	24.8	58.8	11.7	0.0	0.0	0.0	0.0	58.8	1600.3	140.7	1888.2	1465.5	4.3	6.0	36.0
DEC	8.7	24.4	61.5	29.3	0.0	0.0	0.0	0.0	61.5	1493.6	140.3	1783.8	1402.9	4.4	6.0	36.0
JAN	4.5	24.5	62.5	47.3	0.0	0.0	0.0	0.0	62.5	1363.7	139.8	1679.5	1340.3	4.4	6.0	36.0
FEB	2.0	25.0	57.6	41.3	0.0	0.0	0.0	0.0	57.6	1241.6	139.2	1575.2	1277.7	4.0	6.0	36.0
MAR	0.9	28.1	49.0	45.6	0.0	0.0	0.0	0.0	49.0	1119.7	138.5	1470.8	1215.1	3.3	4.5	36.0
TOTAL	1568.8	284.4	944.3	301.3	27.7	0.0	27.7	0.0	944.3					66.6	92.1	424.3

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1969

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	0.6	28.3	46.3	5.7	0.0	0.0	0.0	0.0	46.3	1037.9	138.1	1334.8	1133.5	3.2	4.5	35.4
MAY	20.2	24.8	45.6	1.1	0.0	0.0	0.0	0.0	45.6	986.4	137.9	1238.5	1075.7	3.0	4.5	34.8
JUN	76.3	22.5	49.2	24.6	0.0	0.0	0.0	0.0	49.2	966.2	137.8	1219.3	1064.1	3.2	4.5	34.5
JUL	321.0	21.1	66.7	27.7	0.0	0.0	0.0	0.0	66.7	1171.5	138.5	1315.6	1121.9	4.4	6.0	35.3
AUG	248.0	19.1	64.6	23.2	0.0	0.0	0.0	0.0	64.6	1312.5	139.5	1575.2	1277.7	4.4	6.0	36.0
SEP	312.0	20.9	60.7	24.3	0.0	0.0	0.0	0.0	60.7	1518.5	140.4	1888.2	1465.5	4.3	6.0	36.0
OCT	126.0	25.1	61.6	22.0	0.0	0.0	0.0	0.0	61.6	1535.7	140.5	1966.5	1512.4	4.4	6.0	36.0
NOV	35.8	23.6	59.8	11.7	0.0	0.0	0.0	0.0	59.8	1479.2	140.3	1888.2	1465.5	4.3	6.0	36.0
DEC	11.4	23.2	62.5	29.3	0.0	0.0	0.0	0.0	62.5	1375.4	139.9	1783.8	1402.9	4.4	6.0	36.0
JAN	5.3	23.2	47.7	47.4	0.0	0.0	0.0	0.0	47.7	1262.3	139.3	1679.5	1340.3	3.3	4.5	36.0
FEB	2.3	23.8	44.0	44.4	0.0	0.0	0.0	0.0	44.0	1152.3	138.7	1575.2	1277.7	3.0	4.5	36.0
MAR	0.6	26.8	49.9	52.2	0.0	0.0	0.0	0.0	49.9	1024.0	138.1	1470.8	1215.1	3.3	4.5	35.5
TOTAL	1162.4	283.0	661.3	313.5	0.0	0.0	0.0	0.0	661.3					45.7	68.0	427.7

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1970

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	1.4	26.8	49.1	4.7	0.0	0.0	0.0	0.0	49.1	944.6	137.7	1334.6	1133.5	3.2	4.5	34.6
MAY	12.6	23.2	46.4	1.3	0.0	0.0	0.0	0.0	46.4	886.4	137.4	1238.5	1075.7	3.0	4.5	34.0
JUN	185.9	21.8	49.6	20.9	0.0	0.0	0.0	0.0	49.6	979.9	137.9	1219.3	1064.1	3.2	4.5	34.1
JUL	222.1	20.7	67.2	31.6	0.0	0.0	0.0	0.0	67.2	1082.4	138.4	1315.6	1121.9	4.4	6.0	35.0
AUG	460.8	19.4	64.4	17.7	0.0	0.0	0.0	0.0	64.4	1441.6	140.1	1575.2	1277.7	4.4	6.0	36.0
SEP	257.5	21.8	59.8	34.0	0.0	0.0	0.0	0.0	59.8	1583.4	140.7	1888.2	1465.5	4.3	6.0	36.0
OCT	125.1	25.6	61.2	39.3	0.0	0.0	0.0	0.0	61.2	1582.3	140.7	1966.5	1512.4	4.4	6.0	36.0
NOV	9.9	23.9	59.6	11.7	0.0	0.0	0.0	0.0	59.6	1496.2	140.3	1888.2	1465.5	4.3	6.0	36.0
DEC	40.4	23.5	62.2	29.3	0.0	0.0	0.0	0.0	62.2	1421.4	140.1	1783.8	1402.9	4.4	6.0	36.0
JAN	8.9	23.7	63.2	47.4	0.0	0.0	0.0	0.0	63.2	1295.8	139.4	1679.5	1340.3	4.4	6.0	36.0
FEB	11.6	24.2	43.7	44.4	0.0	0.0	0.0	0.0	43.7	1195.0	138.9	1575.2	1277.7	3.0	4.5	36.0
MAR	12.5	27.4	49.5	52.2	0.0	0.0	0.0	0.0	49.5	1078.3	138.3	1470.8	1215.1	3.3	4.5	35.9
TOTAL	1348.1	282.7	676.4	334.4	0.0	0.0	0.0	0.0	676.4					46.8	64.5	425.7

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1971

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	20.4	27.8	48.6	6.6	0.0	0.0	0.0	0.0	48.6	1015.6	138.0	1334.6	1133.5	3.2	4.5	35.1
MAY	47.5	24.7	45.7	1.4	0.0	0.0	0.0	0.0	45.7	991.0	137.9	1238.5	1075.7	3.0	4.5	34.7
JUN	192.3	23.3	65.0	23.4	0.0	0.0	0.0	0.0	65.0	1071.6	138.3	1219.3	1064.1	4.3	6.0	35.0
JUL	336.8	22.4	65.4	28.0	0.0	0.0	0.0	0.0	65.4	1292.4	139.4	1315.6	1121.9	4.4	6.0	36.0
AUG	283.4	20.5	63.0	21.3	0.0	0.0	0.0	0.0	63.0	1470.8	140.3	1575.2	1277.7	4.4	6.0	36.0
SEP	430.3	22.9	58.8	26.7	0.0	0.0	0.0	0.0	58.8	1792.7	141.5	1888.2	1465.5	4.3	6.0	36.0
OCT	179.7	27.9	59.4	40.3	0.0	0.0	0.0	0.0	59.4	1844.7	141.7	1966.5	1512.4	4.4	6.0	36.0
NOV	13.5	26.4	57.6	11.7	0.0	0.0	0.0	0.0	57.6	1762.4	141.4	1888.2	1465.5	4.3	6.0	36.0
DEC	16.7	25.9	60.2	29.3	0.0	0.0	0.0	0.0	60.2	1663.4	141.0	1783.8	1402.9	4.4	6.0	36.0
JAN	0.4	26.2	61.1	47.4	0.0	0.0	0.0	0.0	61.1	1528.9	140.5	1679.5	1340.3	4.4	6.0	36.0
FEB	16.4	27.2	56.0	25.5	0.0	0.0	0.0	0.0	56.0	1436.5	140.1	1575.2	1277.7	4.0	6.0	36.0
MAR	8.3	31.1	63.0	32.4	0.0	0.0	0.0	0.0	63.0	1318.2	139.6	1470.8	1215.1	4.4	6.0	36.0
TOTAL	1545.6	306.9	704.6	293.9	0.0	0.0	0.0	0.0	704.5					50.0	69.0	428.9

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1972

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAPABILITY MW
APR	26.0	31.4	62.0	6.0	0.0	0.0	0.0	0.0	62.0	1242.6	139.2	1334.8	1133.5	4.3	6.0	36.0
MAY	10.1	27.4	60.9	1.5	0.0	0.0	0.0	0.0	60.9	1162.7	138.8	1238.5	1075.7	4.1	6.0	36.0
JUN	704.8	26.9	371.1	20.9	0.0	0.0	0.0	0.0	371.1	1448.5	140.2	1219.3	1064.1	25.9	36.0	36.0
JUL	586.2	26.5	370.0	27.7	0.0	0.0	0.0	0.0	370.0	1610.4	140.8	1315.6	1121.9	26.7	36.0	36.0
AUG	351.6	22.5	346.5	17.8	0.0	0.0	0.0	0.0	346.5	1575.2	140.7	1575.2	1277.7	25.2	33.9	36.0
SEP	939.4	24.0	347.4	20.1	0.0	0.0	0.0	55.4	402.9	1966.5	142.2	1888.2	1465.5	25.9	36.0	36.0
OCT	319.5	28.9	352.4	21.6	0.0	0.0	0.0	0.0	352.4	1882.9	141.8	1966.5	1512.4	26.7	36.0	36.0
NOV	84.2	27.1	57.1	2.9	0.0	0.0	0.0	0.0	57.1	1879.9	141.8	1888.2	1465.5	4.3	6.0	36.0
DEC	36.8	27.0	79.2	26.7	0.0	0.0	0.0	0.0	79.2	1783.8	141.4	1783.8	1402.9	5.9	8.0	36.0
JAN	0.0	27.3	60.2	44.9	0.0	0.0	0.0	0.0	60.2	1651.2	140.9	1679.5	1340.3	4.4	6.0	36.0
FEB	0.0	28.3	55.2	44.4	0.0	0.0	0.0	0.0	55.2	1523.2	140.5	1575.2	1277.7	4.0	6.0	36.0
MAR	0.0	32.2	62.3	47.6	0.0	0.0	0.0	0.0	62.3	1381.0	139.9	1470.8	1215.1	4.4	6.0	36.0
TOTAL	2957.5	330.1	2224.9	284.0	0.0	0.0	0.0	55.4	2280.4					162.4	221.9	432.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1973

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	SHORTAGE TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAPABILITY MW
APR	0.3	32.3	61.4	5.0	0.0	0.0	0.0	0.0	61.4	1282.5	139.4	1334.8	1133.5	4.3	6.0	36.0
MAY	44.7	28.3	59.0	1.3	0.0	0.0	0.0	0.0	59.0	1238.5	139.1	1238.5	1075.7	4.0	6.0	36.0
JUN	57.9	25.5	62.9	25.1	0.0	0.0	0.0	0.0	62.9	1182.7	138.9	1219.3	1064.1	4.3	6.0	36.0
JUL	178.2	22.7	65.0	27.7	0.0	0.0	0.0	0.0	65.0	1245.4	139.2	1315.6	1121.9	4.4	6.0	36.0
AUG	204.8	19.7	63.9	17.7	0.0	0.0	0.0	0.0	63.9	1348.6	139.7	1575.2	1277.7	4.4	6.0	36.0
SEP	283.8	21.2	60.4	21.4	0.0	0.0	0.0	0.0	60.4	1529.4	140.5	1888.2	1465.5	4.3	6.0	36.0
OCT	37.3	24.7	61.9	28.5	0.0	0.0	0.0	0.0	61.9	1451.4	140.2	1966.5	1512.4	4.4	6.0	36.0
NOV	4.4	22.7	45.4	11.4	0.0	0.0	0.0	0.0	45.4	1375.9	139.9	1888.2	1465.5	3.2	4.5	36.0
DEC	10.4	22.2	47.6	29.3	0.0	0.0	0.0	0.0	47.6	1287.2	139.4	1783.8	1402.9	3.3	4.5	36.0
JAN	16.3	22.2	48.5	47.2	0.0	0.0	0.0	0.0	48.5	1185.5	138.9	1679.5	1340.3	3.3	4.5	36.0
FEB	2.2	22.8	44.7	41.8	0.0	0.0	0.0	0.0	44.7	1078.3	138.3	1575.2	1277.7	3.0	4.5	35.9
MAR	9.1	25.7	50.5	50.4	0.0	0.0	0.0	0.0	50.5	960.7	137.8	1470.8	1215.1	3.3	4.5	34.9
TOTAL	849.3	290.7	671.9	306.7	0.0	0.0	0.0	0.0	671.8					46.7	64.5	430.8

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1974

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	72.2	26.3	49.4	3.2	0.0	0.0	0.0	0.0	49.4	953.8	137.7	1334.8	1133.5	3.2	4.5	34.3
MAY	87.0	24.0	46.0	1.2	0.0	0.0	0.0	0.0	46.0	969.5	137.8	1238.5	1075.7	3.0	4.5	34.4
JUN	107.8	22.5	49.2	22.7	0.0	0.0	0.0	0.0	49.2	982.8	137.9	1219.3	1064.1	3.2	4.5	34.5
JUL	108.0	20.2	50.8	30.1	0.0	0.0	0.0	0.0	50.8	989.7	137.9	1315.6	1121.9	3.3	4.5	34.6
AUG	483.7	18.6	65.4	17.7	0.0	0.0	0.0	0.0	65.4	1371.6	139.8	1575.2	1277.7	4.4	6.0	36.0
SEP	211.8	21.1	60.5	23.5	0.0	0.0	0.0	0.0	60.5	1478.2	140.3	1888.2	1465.5	4.3	6.0	36.0
OCT	180.0	24.9	61.8	26.2	0.0	0.0	0.0	0.0	61.8	1545.3	140.5	1966.5	1512.4	4.4	6.0	36.0
NOV	94.8	24.0	59.5	3.8	0.0	0.0	0.0	0.0	59.5	1552.7	140.6	1888.2	1465.5	4.3	6.0	36.0
DEC	22.7	24.0	61.8	28.9	0.0	0.0	0.0	0.0	61.8	1460.5	140.2	1783.8	1402.9	4.4	6.0	36.0
JAN	2.6	24.1	62.8	45.4	0.0	0.0	0.0	0.0	62.8	1330.6	139.6	1679.5	1340.3	4.4	6.0	36.0
FEB	0.0	24.7	43.4	33.1	0.0	0.0	0.0	0.0	43.4	1229.3	139.1	1575.2	1277.7	3.0	4.5	36.0
MAR	12.2	27.9	49.1	51.0	0.0	0.0	0.0	0.0	49.1	1113.3	138.5	1470.8	1215.1	3.3	4.5	36.0
TOTAL	1382.7	283.0	660.2	286.7	0.0	0.0	0.0	0.0	660.2					45.7	63.0	425.9

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1975

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH STORAGE MCM	END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	20.0	28.3	48.3	4.8	0.0	0.0	0.0	0.0	48.3	1051.8	138.2	1334.8	1133.5	3.2	4.5	35.4
MAY	115.4	25.6	60.3	1.1	0.0	0.0	0.0	0.0	60.3	1080.2	138.4	1238.5	1075.7	4.0	6.0	35.3
JUN	320.6	24.8	135.7	20.9	0.0	0.0	0.0	0.0	135.7	1219.3	139.1	1219.3	1064.1	9.2	12.7	36.0
JUL	247.1	23.4	99.6	27.7	0.0	0.0	0.0	0.0	99.6	1315.6	139.6	1315.6	1121.9	6.9	9.2	36.0
AUG	544.1	21.1	245.6	17.7	0.0	0.0	0.0	0.0	245.6	1575.2	140.7	1575.2	1277.7	17.5	23.5	36.0
SEP	484.5	22.8	353.9	20.1	0.0	0.0	0.0	0.0	353.9	1662.8	141.0	1888.2	1465.5	25.9	36.0	36.0
OCT	239.8	27.0	60.1	18.0	0.0	0.0	0.0	0.0	60.1	1796.5	141.5	1966.5	1512.4	4.4	6.0	36.0
NOV	41.2	26.1	57.8	2.9	0.0	0.0	0.0	0.0	57.8	1750.7	141.3	1888.2	1465.5	4.3	6.0	36.0
DEC	16.8	25.8	60.3	29.2	0.0	0.0	0.0	0.0	60.3	1652.0	140.9	1783.8	1402.9	4.4	6.0	36.0
JAN	13.2	26.1	61.1	47.4	0.0	0.0	0.0	0.0	61.1	1530.3	140.5	1679.5	1340.3	4.4	6.0	36.0
FEB	14.7	27.1	56.1	44.4	0.0	0.0	0.0	0.0	56.1	1417.3	140.0	1575.2	1277.7	4.0	0.0	36.0
MAR	29.2	30.9	63.2	47.4	0.0	0.0	0.0	0.0	63.2	1305.0	139.5	1470.8	1215.1	4.4	6.0	36.0
TOTAL	2085.5	309.5	1302.6	281.5	0.0	0.0	0.0	0.0	1302.6					93.0	128.1	430.8

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1976

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	27.9	31.2	62.2	5.7	0.0	0.0	0.0	0.0	62.2	1233.7	139.1	1334.8	1133.5	4.3	6.0	36.0
MAY	62.2	27.6	60.7	1.1	0.0	0.0	0.0	0.0	60.7	1206.3	139.0	1238.5	1075.7	4.1	6.0	36.0
JUN	75.0	25.2	63.2	22.5	0.0	0.0	0.0	0.0	63.2	1170.3	138.8	1219.3	1064.1	4.3	6.0	36.0
JUL	157.1	22.4	65.3	27.7	0.0	0.0	0.0	0.0	65.3	1211.9	139.0	1315.6	1121.9	4.4	6.0	36.0
AUG	285.5	19.8	63.8	17.7	0.0	0.0	0.0	0.0	63.6	1396.0	140.0	1575.2	1277.7	4.4	6.0	36.0
SEP	348.2	21.9	59.7	21.1	0.0	0.0	0.0	0.0	59.7	1641.4	140.9	1888.2	1465.5	4.3	6.0	36.0
OCT	171.0	26.5	60.5	17.7	0.0	0.0	0.0	0.0	60.5	1707.7	141.2	1966.5	1512.4	4.4	6.0	36.0
NOV	44.0	25.3	58.5	6.9	0.0	0.0	0.0	0.0	58.5	1660.9	141.0	1888.2	1465.5	4.3	6.0	36.0
DEC	20.2	25.0	60.9	27.9	0.0	0.0	0.0	0.0	60.9	1567.1	140.6	1783.8	1402.9	4.4	6.0	36.0
JAN	16.4	25.3	61.8	47.4	0.0	0.0	0.0	0.0	61.8	1448.8	140.2	1679.5	1340.3	4.4	6.0	36.0
FEB	1.1	26.1	56.8	44.4	0.0	0.0	0.0	0.0	56.8	1322.5	139.6	1575.2	1277.7	4.0	6.0	36.0
MAR	10.3	29.3	64.3	34.7	0.0	0.0	0.0	0.0	64.3	1204.3	139.0	1470.8	1215.1	4.4	6.0	36.0
TOTAL	1219.8	306.2	736.3	274.7	0.0	0.0	0.0	0.0	736.3					52.2	72.0	432.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1977

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	12.5	29.5	63.5	4.1	0.0	0.0	0.0	0.0	63.5	1119.5	138.5	1334.8	1133.5	4.3	6.0	36.0
MAY	19.8	25.8	60.1	1.7	0.0	0.0	0.0	0.0	60.1	1051.5	138.2	1238.5	1075.7	4.0	6.0	35.5
JUN	10.5	22.9	48.9	26.6	0.0	0.0	0.0	0.0	48.9	963.5	137.8	1219.3	1064.1	3.2	4.5	34.8
JUL	94.7	19.8	51.0	28.3	0.0	0.0	0.0	0.0	51.0	958.9	137.8	1315.6	1121.9	3.3	4.5	34.4
AUG	312.1	17.5	50.0	19.4	0.0	0.0	0.0	0.0	50.0	1184.1	138.9	1575.2	1277.7	3.3	4.5	35.3
SEP	569.9	20.8	60.8	20.1	0.0	0.0	0.0	0.0	60.8	1652.2	140.9	1888.2	1465.5	4.3	6.0	36.0
OCT	82.8	26.1	60.8	44.9	0.0	0.0	0.0	0.0	60.8	1603.1	140.8	1966.5	1512.4	4.4	6.0	36.0
NOV	7.9	24.1	59.4	11.4	0.0	0.0	0.0	0.0	59.4	1515.9	140.4	1888.2	1465.5	4.3	6.0	36.0
DEC	4.5	23.6	62.2	29.3	0.0	0.0	0.0	0.0	62.2	1405.1	140.0	1783.8	1402.9	4.4	6.0	36.0
JAN	1.2	23.5	47.5	47.4	0.0	0.0	0.0	0.0	47.5	1287.8	139.4	1679.5	1340.3	3.3	4.5	36.0
FEB	6.7	24.1	43.8	44.4	0.0	0.0	0.0	0.0	43.8	1152.1	138.9	1575.2	1277.7	3.0	4.5	36.0
MAR	17.5	27.3	49.5	45.7	0.0	0.0	0.0	0.0	49.5	1077.0	138.3	1470.8	1215.1	3.3	4.5	35.9
TOTAL	1140.0	285.6	658.2	323.2	0.0	0.0	0.0	0.0	658.2					45.5	63.0	428.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

YEAR1978

MON	INFLOW MCM	EVAP MCM	RELEASE FOR POWER MCM	RELEASE FOR IRR MCM	SHORTAGE POWER MCM	SHORTAGE IRR MCM	TOTAL MCM	SPILL MCM	RIVER FLOW MCM	MONTH END STORAGE MCM	MONTH END LEVEL M	TOP LEVEL CONSV M	TOP LEVEL BUFFER M	AVERAGE ENERGY MKWH	AVERAGE POWER MW	CAP-BILITY MW
APR	21.3	27.8	48.6	3.2	0.0	0.0	0.0	0.0	48.6	1018.6	138.0	1334.8	1133.5	3.2	4.5	35.1
MAY	41.3	24.7	45.7	1.3	0.0	0.0	0.0	0.0	45.7	988.0	137.9	1238.5	1075.7	3.0	4.5	34.7
JUN	92.2	22.7	49.1	21.1	0.0	0.0	0.0	0.0	49.1	987.2	137.9	1219.3	1064.1	3.2	4.5	34.6
JUL	306.3	21.2	66.6	29.4	0.0	0.0	0.0	0.0	66.6	1176.1	138.8	1315.6	1121.9	4.4	6.0	35.4
AUG	798.9	20.4	361.7	17.7	0.0	0.0	0.0	0.0	361.7	1575.2	140.7	1575.2	1277.7	25.5	34.2	36.0
SEP	520.7	22.9	353.1	20.1	0.0	0.0	0.0	0.0	353.1	1699.6	141.1	1888.2	1465.5	25.9	36.0	36.0
OCT	202.6	27.2	60.0	27.3	0.0	0.0	0.0	0.0	60.0	1787.8	141.5	1966.5	1512.4	4.4	6.0	36.0
NOV	33.7	26.0	57.9	6.3	0.0	0.0	0.0	0.0	57.9	1731.1	141.2	1888.2	1465.5	4.3	6.0	36.0
DEC	2.0	25.6	60.5	29.3	0.0	0.0	0.0	0.0	60.5	1617.5	140.8	1783.8	1402.9	4.4	6.0	36.0
JAN	8.8	25.7	61.4	47.4	0.0	0.0	0.0	0.0	61.4	1491.5	140.3	1679.5	1340.3	4.4	6.0	36.0
FEB	8.1	26.6	56.4	44.4	0.0	0.0	0.0	0.0	56.4	1372.1	139.8	1575.2	1277.7	4.0	6.0	36.0
MAR	8.4	30.0	63.8	52.2	0.0	0.0	0.0	0.0	63.8	1234.4	139.1	1470.8	1215.1	4.4	6.0	36.0
TOTAL	2044.2	301.4	1285.4	299.6	0.0	0.0	0.0	0.0	1285.4					91.6	125.7	428.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

INFLOW (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	0.8	15.5	84.8	145.9	145.9	210.7	184.4	13.7	4.3	1.6	0.7	0.5
1956	0.5	59.7	147.0	209.1	272.9	440.6	167.6	21.5	7.0	2.7	1.0	0.8
1957	0.8	18.2	63.0	146.8	356.7	482.1	314.4	40.7	12.8	4.3	1.7	0.8
1958	0.8	7.0	52.6	125.3	293.8	461.4	146.8	20.2	6.2	2.7	1.0	0.8
1959	0.8	18.2	21.5	145.9	252.3	482.1	126.1	16.3	5.1	1.6	0.7	0.8
1960	0.5	18.5	63.0	104.4	126.1	419.1	189.1	24.6	8.6	2.1	0.7	0.5
1961	0.3	14.5	57.8	240.2	427.1	426.1	369.8	44.3	13.1	4.5	1.4	1.3
1962	4.7	32.4	201.1	389.6	555.7	708.1	217.4	26.7	10.7	4.0	1.7	1.1
1963	0.5	5.4	29.3	137.4	348.7	442.4	311.2	42.0	11.8	3.5	1.4	0.5
1964	1.0	69.6	44.6	49.0	263.0	357.7	197.4	24.1	9.9	2.9	1.4	0.8
1965	3.4	6.2	254.0	270.5	324.0	318.8	101.0	16.8	6.2	2.9	1.0	0.8
1966	1.6	136.3	76.5	393.7	479.4	487.3	65.9	27.7	13.1	4.8	1.9	1.1
1967	4.9	5.1	69.7	167.4	276.5	401.8	222.3	38.4	12.3	3.5	2.9	2.0
1968	0.4	11.3	31.1	50.4	687.0	677.0	91.2	24.4	8.7	4.5	2.0	0.9
1969	0.6	20.2	76.3	321.0	248.0	312.0	126.0	38.8	11.4	5.3	2.3	0.6
1970	1.4	12.8	185.9	222.1	460.8	257.5	125.1	9.2	40.4	8.9	11.6	12.5
1971	20.4	47.5	192.3	336.8	263.4	430.3	179.7	13.5	16.7	0.4	16.4	8.3
1972	26.0	10.1	704.8	586.2	351.6	838.4	319.5	84.2	36.8	0.0	0.0	0.0
1973	0.3	44.7	57.9	178.2	204.8	283.8	37.3	4.4	10.4	16.3	2.2	9.1
1974	72.2	87.0	107.8	108.0	483.7	211.8	180.0	94.8	22.7	2.6	0.0	12.2
1975	20.0	115.4	320.6	247.1	544.1	434.5	238.8	41.2	16.8	13.2	14.7	29.2
1976	27.9	62.2	75.0	157.1	285.5	348.2	171.0	44.0	20.2	16.4	1.1	10.3
1977	12.5	19.8	10.5	94.7	312.1	569.9	82.5	7.9	4.5	1.2	6.7	17.5
1978	21.3	41.3	92.2	306.3	798.9	520.7	202.6	33.7	2.0	8.8	8.1	8.4

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

RIVER FLOW (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	350.3	252.0	62.7	64.8	64.3	46.0	62.5	45.4	47.5	48.5	44.8	50.5
1956	49.7	48.4	49.9	50.9	49.6	61.1	61.3	59.4	62.1	63.3	43.8	49.5
1957	48.7	46.0	49.6	51.2	49.9	60.8	60.3	57.9	60.4	61.3	56.3	63.8
1958	63.3	60.1	48.8	50.5	66.1	60.9	61.1	59.4	62.1	63.3	43.8	49.7
1959	48.9	46.2	50.1	51.9	51.1	62.8	46.9	45.5	47.7	48.7	44.9	50.8
1960	50.0	3.5	17.2	52.1	52.0	48.7	48.4	46.6	48.8	49.8	45.9	29.1
1961	0.0	0.0	13.9	51.5	65.9	60.3	59.9	57.3	59.7	60.6	55.5	62.5
1962	61.8	58.5	133.7	241.5	257.2	349.0	358.0	58.6	61.3	62.2	57.4	48.8
1963	48.2	45.6	49.4	51.2	50.0	61.1	60.7	58.2	60.7	61.6	56.7	64.1
1964	63.5	62.1	64.7	50.6	50.1	62.1	62.3	60.1	47.1	48.0	44.3	50.1
1965	49.4	46.6	66.2	66.6	64.3	60.0	61.3	59.7	62.5	47.7	44.1	49.8
1966	49.0	61.1	48.9	65.9	138.8	353.9	60.8	59.2	61.9	63.0	43.6	49.4
1967	48.7	46.0	49.7	51.1	50.0	61.7	61.6	59.4	62.0	63.2	43.7	49.6
1968	48.8	47.8	50.0	24.4	66.0	356.9	60.4	58.8	61.5	62.5	57.6	49.0
1969	48.3	45.6	49.2	66.7	64.6	60.7	61.6	59.8	62.5	47.7	44.0	49.9
1970	49.1	46.4	49.6	67.2	64.4	59.8	61.2	59.6	62.2	63.2	43.7	49.5
1971	48.6	45.7	65.0	65.4	63.0	58.8	59.4	57.6	60.2	61.1	56.0	63.0
1972	62.0	60.9	371.1	370.0	346.5	402.9	352.4	57.1	79.2	60.2	55.2	62.3
1973	61.4	59.0	62.9	65.0	63.9	60.4	61.9	45.4	47.6	48.5	44.7	50.5
1974	49.4	46.0	49.2	50.8	65.4	60.5	61.8	59.5	61.8	62.8	43.4	49.1
1975	48.3	60.3	135.7	99.5	245.6	353.9	60.1	57.8	60.3	61.1	56.1	63.2
1976	62.2	60.7	63.2	65.3	63.8	59.7	60.5	58.5	60.9	61.8	56.8	64.3
1977	63.5	60.1	48.9	51.0	50.0	60.8	60.8	59.4	62.2	47.5	43.8	49.5
1978	48.6	45.7	49.1	66.6	361.7	353.1	60.0	57.9	60.5	61.4	56.4	63.8

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

EVAPOLATION (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	37.6	29.9	25.7	22.9	19.3	20.2	24.1	22.8	22.3	22.2	22.8	25.6
1956	25.6	22.5	21.2	19.9	17.9	20.5	25.5	24.2	23.7	23.6	24.1	27.3
1957	27.7	24.2	21.7	19.4	17.6	20.8	26.7	26.0	25.7	25.9	26.8	30.0
1958	29.8	25.9	23.2	20.6	18.0	20.7	25.7	24.2	23.7	23.6	24.0	27.1
1959	27.2	23.7	20.9	18.3	16.3	19.1	24.0	22.6	22.1	22.0	22.5	25.2
1960	24.9	21.8	20.2	18.0	15.1	17.1	22.0	21.2	20.7	20.6	21.0	23.4
1961	23.9	21.8	20.2	19.0	18.1	21.3	27.2	26.9	26.6	26.8	27.9	31.8
1962	31.8	27.7	25.5	23.4	21.1	23.7	27.7	25.1	24.6	24.8	25.4	28.4
1963	28.6	24.9	22.2	19.4	17.5	20.5	26.2	25.6	25.3	25.5	26.3	29.6
1964	29.6	26.1	23.6	20.3	17.4	19.6	24.4	23.3	22.9	22.8	23.4	26.4
1965	26.4	22.8	21.8	21.2	19.4	21.6	25.5	23.8	23.2	23.2	23.7	26.9
1966	27.2	24.5	23.0	21.9	20.9	22.8	26.2	24.3	23.9	23.9	24.4	27.5
1967	27.7	24.1	21.7	19.6	17.5	20.0	25.1	24.1	23.7	23.7	24.2	27.2
1968	27.4	23.9	21.1	18.1	17.9	22.2	26.6	24.8	24.4	24.5	25.0	28.1
1969	28.3	24.8	22.5	21.1	19.1	20.9	25.1	23.6	23.2	23.2	23.8	26.8
1970	26.8	23.2	21.8	20.7	19.4	21.8	25.6	23.9	23.5	23.7	24.2	27.4
1971	27.8	24.7	23.3	22.4	20.5	22.9	27.9	26.4	25.9	26.2	27.2	31.1
1972	31.4	27.4	26.9	26.5	22.5	24.0	28.9	27.1	27.0	27.3	28.3	32.2
1973	32.3	28.3	25.5	22.7	19.7	21.2	24.7	22.7	22.2	22.2	22.8	25.7
1974	26.3	24.0	22.5	20.2	18.6	21.1	24.9	24.0	24.0	24.1	24.7	27.9
1975	28.3	25.6	24.8	23.4	21.1	22.8	27.0	26.1	25.8	26.1	27.1	30.9
1976	31.2	27.6	25.2	22.4	19.8	21.9	26.5	25.3	25.0	25.3	26.1	29.3
1977	29.5	25.8	22.9	19.8	17.5	20.8	26.1	24.1	23.6	23.5	24.1	27.3
1978	27.8	24.7	22.7	21.2	20.4	22.9	27.2	26.0	25.6	25.7	26.6	30.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

POWER RELEASE (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	350.3	252.0	62.7	64.8	64.3	46.0	62.5	45.4	47.5	48.5	44.8	50.5
1956	49.7	46.4	49.9	50.9	49.6	61.1	61.3	59.4	62.1	63.3	43.8	49.5
1957	46.7	46.0	49.6	51.2	49.9	60.8	60.3	57.9	60.4	61.3	56.3	63.8
1958	63.3	60.1	48.8	50.5	66.1	60.9	61.1	59.4	62.1	63.3	43.8	49.7
1959	48.9	46.2	50.1	51.9	51.1	62.8	46.9	45.5	47.7	48.7	44.9	50.8
1960	50.0	3.5	17.2	52.1	52.0	48.7	48.4	46.6	48.8	49.8	45.9	29.1
1961	0.0	0.0	13.9	51.5	65.9	60.3	59.9	57.3	59.7	60.6	55.5	62.5
1962	61.8	58.5	133.7	241.5	257.2	349.0	358.0	58.6	61.3	62.2	57.4	48.8
1963	48.2	45.6	49.4	51.2	50.0	61.1	60.7	58.2	60.7	61.6	56.7	64.1
1964	63.5	62.1	64.7	50.6	50.1	62.1	62.3	60.1	47.1	48.0	44.3	50.1
1965	49.4	46.6	66.2	66.6	64.3	60.0	61.3	59.7	62.5	47.7	44.1	49.8
1966	49.0	61.1	48.9	65.9	136.8	353.9	60.8	59.2	61.9	63.0	43.6	49.4
1967	48.7	46.0	49.7	51.1	50.0	61.7	61.6	59.4	62.0	63.2	43.7	49.6
1968	48.8	47.8	50.0	24.4	66.0	356.9	60.4	58.8	61.5	62.5	57.6	49.0
1969	48.3	45.6	49.2	66.7	64.6	60.7	61.6	59.8	62.5	47.7	44.0	49.9
1970	49.1	46.4	49.6	67.2	64.4	59.8	61.2	59.6	62.2	63.2	43.7	49.5
1971	48.6	45.7	65.0	65.4	63.0	58.8	59.4	57.6	60.2	61.1	56.0	63.0
1972	62.0	60.9	371.1	370.0	346.5	347.4	352.4	57.1	79.2	60.2	55.2	62.3
1973	61.4	59.0	62.9	65.0	63.9	60.4	61.9	45.4	47.6	48.5	44.7	50.5
1974	49.4	46.0	49.2	50.8	65.4	60.5	61.8	59.5	61.8	62.8	43.4	49.1
1975	48.3	60.3	135.7	99.6	245.6	353.9	60.1	57.8	60.3	61.1	56.1	63.2
1976	62.2	60.7	63.2	65.3	63.8	59.7	60.5	58.5	60.9	61.8	56.8	64.3
1977	63.5	60.1	48.9	51.0	50.0	60.8	60.6	59.4	62.2	47.5	43.8	49.5
1978	48.6	45.7	49.1	66.6	301.7	353.1	60.0	57.9	60.5	61.4	56.4	63.8

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

IRRIGATION RELEASE (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	6.6	1.3	20.9	29.6	22.3	27.9	42.7	9.9	29.3	47.4	38.3	41.0
1956	3.2	1.1	24.6	27.7	24.6	20.1	27.6	10.6	29.3	47.4	43.8	23.2
1957	3.7	1.8	23.2	36.2	17.7	20.1	36.2	11.7	29.3	47.4	44.4	52.2
1958	12.7	1.5	24.4	29.0	17.7	21.9	39.1	9.9	29.3	47.4	44.4	51.2
1959	4.5	1.5	24.9	42.1	27.8	25.6	26.4	11.7	29.3	47.4	44.4	49.4
1960	9.6	1.3	25.5	31.9	20.6	23.8	21.6	9.4	29.3	47.4	44.4	45.4
1961	0.0	0.0	23.6	27.7	17.7	24.1	17.8	11.7	29.3	47.4	19.5	50.4
1962	10.1	1.1	21.9	28.3	17.7	20.1	26.2	11.7	29.3	47.4	44.4	47.2
1963	12.5	1.6	25.0	38.9	20.7	25.9	18.5	4.3	29.3	47.4	44.4	30.2
1964	12.0	1.1	24.6	28.2	20.1	20.1	17.7	2.9	29.3	47.4	43.6	48.9
1965	3.2	1.1	20.9	31.3	19.9	21.8	41.3	11.4	29.3	47.4	42.8	28.9
1966	3.5	1.1	20.9	32.0	17.7	23.4	26.7	11.7	29.3	47.4	44.4	52.2
1967	3.2	1.3	24.7	27.7	17.7	20.1	21.8	7.7	29.3	47.4	44.4	51.6
1968	3.2	1.3	28.9	28.1	17.7	20.1	26.9	11.7	29.3	47.3	41.3	45.6
1969	5.7	1.1	24.6	27.7	23.2	24.3	22.0	11.7	29.3	47.4	44.4	52.2
1970	4.7	1.3	20.9	31.6	17.7	34.0	39.3	11.7	29.3	47.4	44.4	52.2
1971	6.6	1.4	23.4	28.0	21.3	26.7	40.3	11.7	29.3	47.4	25.5	32.4
1972	8.0	1.5	20.9	27.7	17.8	20.1	21.6	2.9	26.7	44.9	44.4	47.6
1973	5.0	1.3	25.1	27.7	17.7	21.4	28.5	11.4	29.3	47.2	41.8	50.4
1974	3.2	1.2	22.7	30.1	17.7	23.5	26.2	3.8	26.9	45.4	33.1	51.0
1975	4.8	1.1	20.9	27.7	17.7	20.1	18.0	2.9	29.2	47.4	44.4	47.4
1976	5.7	1.1	22.5	27.7	17.7	21.1	17.7	6.9	27.9	47.4	44.4	34.7
1977	4.1	1.7	26.6	28.3	19.4	20.1	44.9	11.4	29.3	47.4	44.4	45.7
1978	3.2	1.3	21.1	29.4	17.7	20.1	27.3	6.3	29.3	47.4	44.4	52.2

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

POWER SHORTAGE (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	0.0	45.2	33.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6
1961	50.5	47.1	36.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

IRRIGATION SHORTAGE (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1961	10.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

TOTAL SHORTAGE (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	0.0	45.2	33.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6
1961	60.8	48.3	36.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	27.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

SPILL (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1956	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1957	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1958	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1959	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1960	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1961	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1962	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1963	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1964	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1965	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1966	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1967	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1968	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1969	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1970	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1971	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1972	0.0	0.0	0.0	0.0	0.0	55.4	0.0	0.0	0.0	0.0	0.0	0.0
1973	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1974	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1975	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1976	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1977	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1978	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SIRIKDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

MONTH-END RESERVOIR ELEVATION (M.MSL)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	140.4	139.1	139.0	139.2	139.4	140.0	140.2	139.9	139.4	138.8	138.3	137.7
1956	137.4	137.3	137.6	138.1	139.0	140.5	140.7	140.5	140.0	139.4	138.8	138.3
1957	137.9	137.7	137.5	137.7	139.1	140.8	141.5	141.3	140.9	140.4	139.9	139.1
1958	138.6	138.2	138.0	138.1	139.1	140.7	140.7	140.5	140.0	139.4	138.8	138.2
1959	137.8	137.5	137.2	137.4	138.1	140.0	140.1	139.8	139.3	138.7	138.2	137.6
1960	137.2	137.2	137.2	137.2	137.3	139.0	139.5	139.2	138.7	138.1	137.6	137.2
1961	137.2	137.2	137.2	137.8	139.5	140.8	141.8	141.6	141.2	140.7	140.4	139.7
1962	139.2	138.9	139.1	139.6	140.7	141.9	141.1	140.8	140.4	139.9	139.3	138.7
1963	138.2	137.9	137.6	137.7	139.0	140.5	141.3	141.1	140.7	140.2	139.7	139.0
1964	138.5	138.4	138.1	137.8	138.7	140.0	140.4	140.1	139.7	139.1	138.6	137.9
1965	137.6	137.3	138.0	138.7	139.9	140.7	140.6	140.3	139.9	139.3	138.7	138.2
1966	137.8	138.0	137.9	139.3	140.7	141.0	140.8	140.5	140.1	139.5	139.0	138.3
1967	138.0	137.6	137.5	137.8	138.8	140.2	140.7	140.5	140.1	139.5	138.9	138.3
1968	137.9	137.6	137.2	137.2	140.0	141.1	141.0	140.7	140.3	139.8	139.2	138.5
1969	138.1	137.9	137.8	138.8	139.5	140.4	140.5	140.3	139.9	139.3	138.7	138.1
1970	137.7	137.4	137.9	138.4	140.1	140.7	140.7	140.3	140.1	139.4	138.9	138.3
1971	138.0	137.9	138.3	139.4	140.3	141.5	141.7	141.4	141.0	140.5	140.1	139.6
1972	139.2	138.8	140.2	140.8	140.7	142.2	141.8	141.8	141.4	140.9	140.5	139.9
1973	139.4	139.1	138.9	139.2	139.7	140.5	140.2	139.9	139.4	138.9	138.3	137.8
1974	137.7	137.8	137.9	137.9	139.8	140.3	140.5	140.6	140.2	139.6	139.1	138.5
1975	138.2	138.4	139.1	139.6	140.7	141.0	141.5	141.3	140.9	140.5	140.0	139.5
1976	139.1	139.0	138.8	139.0	140.0	140.9	141.2	141.0	140.6	140.2	139.6	139.0
1977	138.5	138.2	137.8	137.8	138.9	140.9	140.8	140.4	140.0	139.4	138.9	138.3
1978	138.0	137.9	137.9	138.8	140.7	141.1	141.5	141.2	140.8	140.3	139.8	139.1

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

MONTH-END RESERVOIR VOLUME (MCM)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	1506.3	1238.5	1213.8	1242.3	1282.1	1398.7	1453.7	1389.1	1294.2	1177.6	1072.4	955.6
1956	877.6	865.1	916.3	1026.8	1207.5	1546.3	1599.4	1526.6	1418.4	1296.7	1175.9	1076.5
1957	997.2	943.3	911.6	951.5	1223.0	1603.2	1794.2	1739.2	1636.4	1505.9	1360.0	1234.7
1958	1129.6	1049.1	1005.1	1030.2	1222.1	1579.8	1600.6	1527.2	1418.1	1286.4	1175.0	1047.8
1959	967.8	914.6	840.1	873.6	1030.7	1405.2	1434.0	1370.2	1276.2	1159.6	1048.4	923.7
1960	839.6	831.4	831.4	833.6	872.0	1201.5	1298.5	1245.8	1155.4	1039.5	928.8	831.4
1961	831.4	831.4	831.4	973.3	1298.5	1618.8	1663.5	1631.8	1729.1	1598.7	1497.1	1353.6
1962	1254.5	1199.3	1219.3	1315.6	1575.2	1690.2	1695.7	1626.9	1522.2	1391.6	1266.1	1142.6
1963	1053.8	987.0	919.6	947.4	1208.0	1542.8	1745.5	1702.2	1598.5	1467.2	1341.2	1217.7
1964	1113.5	1093.8	1025.3	975.1	1150.4	1406.2	1499.3	1436.9	1347.5	1232.0	1122.1	997.4
1965	921.7	857.3	1002.4	1153.6	1373.9	1589.2	1562.0	1483.8	1374.8	1259.3	1149.6	1044.7
1966	966.6	1016.1	999.6	1273.2	1575.2	1662.3	1614.4	1546.7	1444.5	1314.8	1204.2	1076.1
1967	1001.3	934.9	908.5	977.4	1170.6	1470.6	1584.3	1531.4	1428.4	1297.5	1187.9	1061.4
1968	982.3	920.6	851.6	831.4	1416.6	1694.2	1671.4	1600.3	1493.6	1363.7	1241.6	1119.7
1969	1037.9	986.4	966.2	1171.5	1312.5	1518.5	1535.7	1479.2	1375.4	1262.3	1152.3	1024.0
1970	944.6	886.4	979.9	1082.4	1441.6	1583.4	1562.3	1496.2	1421.4	1295.8	1195.0	1078.3
1971	1015.6	991.0	1071.6	1292.4	1470.8	1792.7	1844.7	1762.4	1663.4	1528.9	1436.5	1318.2
1972	1242.6	1162.7	1448.5	1610.4	1575.2	1966.5	1882.9	1879.9	1783.8	1651.2	1523.2	1381.0
1973	1282.5	1238.5	1182.7	1245.4	1348.6	1529.4	1451.4	1375.9	1287.2	1185.5	1078.3	960.7
1974	953.8	969.5	982.8	989.7	1371.6	1478.2	1545.3	1552.7	1460.5	1330.6	1229.3	1113.3
1975	1051.8	1080.2	1219.3	1315.6	1575.2	1662.8	1796.5	1750.7	1652.0	1530.3	1417.3	1305.0
1976	1233.7	1206.3	1170.3	1211.9	1396.0	1641.4	1707.7	1660.9	1567.1	1446.8	1322.5	1204.3
1977	1119.5	1051.5	963.5	958.9	1184.1	1652.2	1663.1	1515.9	1405.1	1287.8	1182.1	1077.0
1978	1018.6	988.0	987.2	1176.1	1575.2	1699.6	1787.8	1731.1	1617.5	1491.5	1372.1	1234.4

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

ENERGY GENERATION (MK.H)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	25.9	17.8	4.3	4.4	4.4	3.2	4.4	3.2	3.3	3.3	3.0	3.3
1956	3.2	3.1	3.2	3.3	3.3	4.3	4.4	4.3	4.4	4.4	3.0	3.3
1957	3.2	3.0	3.2	3.3	3.3	4.3	4.4	4.3	4.4	4.4	4.0	4.4
1958	4.3	4.0	3.2	3.3	4.4	4.3	4.4	4.3	4.4	4.4	3.0	3.3
1959	3.2	3.0	3.2	3.3	3.3	4.3	3.3	3.2	3.3	3.3	3.0	3.3
1960	3.2	0.2	1.1	3.3	3.3	3.2	3.3	3.2	3.3	3.3	3.0	1.8
1961	0.0	0.0	0.8	3.3	4.4	4.3	4.4	4.3	4.4	4.4	4.0	4.4
1962	4.3	4.0	9.1	16.7	18.3	25.9	26.7	4.3	4.4	4.4	4.0	3.3
1963	3.2	3.0	3.2	3.3	3.3	4.3	4.4	4.3	4.4	4.4	4.0	4.4
1964	4.3	4.1	4.3	3.3	3.3	4.3	4.4	4.3	3.3	3.3	3.0	3.3
1965	3.2	3.0	4.3	4.4	4.4	4.3	4.4	4.3	4.4	3.3	3.0	3.3
1966	3.2	4.0	3.2	4.4	9.8	25.9	4.4	4.3	4.4	4.4	3.0	3.3
1967	3.2	3.0	3.2	3.3	3.3	4.3	4.4	4.3	4.4	4.4	3.0	3.3
1968	3.2	3.1	3.2	1.5	4.4	25.9	4.4	4.3	4.4	4.4	4.0	3.3
1969	3.2	3.0	3.2	4.4	4.4	4.3	4.4	4.3	4.4	3.3	3.0	3.3
1970	3.2	3.0	3.2	4.4	4.4	4.3	4.4	4.3	4.4	4.4	3.0	3.3
1971	3.2	3.0	4.3	4.4	4.4	4.3	4.4	4.3	4.4	4.4	4.0	4.4
1972	4.3	4.1	25.9	26.7	25.2	25.9	26.7	4.3	5.9	4.4	4.0	4.4
1973	4.3	4.0	4.3	4.4	4.4	4.3	4.4	3.2	3.3	3.3	3.0	3.3
1974	3.2	3.0	3.2	3.3	4.4	4.3	4.4	4.3	4.4	4.4	3.0	3.3
1975	3.2	4.0	9.2	6.9	17.5	25.9	4.4	4.3	4.4	4.4	4.0	4.4
1976	4.3	4.1	4.3	4.4	4.4	4.3	4.4	4.3	4.4	4.4	4.0	4.4
1977	4.3	4.0	3.2	3.3	3.3	4.3	4.4	4.3	4.4	3.3	3.0	3.3
1978	3.2	3.0	3.2	4.4	25.5	25.9	4.4	4.3	4.4	4.4	4.0	4.4

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

POWER GENERATION (MW)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	36.0	26.4	6.0	6.0	6.0	4.5	6.0	4.5	4.5	4.5	4.5	4.5
1956	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	4.5	4.5
1957	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1958	6.0	6.0	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5
1959	4.5	4.5	4.5	4.5	4.5	6.0	4.5	4.5	4.5	4.5	4.5	4.5
1960	4.5	0.3	1.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	2.5
1961	0.0	0.0	1.2	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1962	6.0	6.0	12.7	22.5	24.7	36.0	36.0	6.0	6.0	6.0	6.0	4.5
1963	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1964	6.0	6.0	6.0	4.5	4.5	6.0	6.0	6.0	4.5	4.5	4.5	4.5
1965	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5	4.5
1966	4.5	6.0	4.5	6.0	13.2	36.0	6.0	6.0	6.0	6.0	4.5	4.5
1967	4.5	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	4.5	4.5
1968	4.5	4.5	4.5	2.1	6.0	36.0	6.0	6.0	6.0	6.0	6.0	4.5
1969	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5	4.5
1970	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5
1971	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1972	6.0	6.0	36.0	36.0	33.9	36.0	36.0	6.0	8.0	6.0	6.0	6.0
1973	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5	4.5	4.5	4.5
1974	4.5	4.5	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	4.5	4.5
1975	4.5	6.0	12.7	9.2	23.5	36.0	6.0	6.0	6.0	6.0	6.0	6.0
1976	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1977	6.0	6.0	4.5	4.5	4.5	6.0	6.0	6.0	6.0	4.5	4.5	4.5
1978	4.5	4.5	4.5	6.0	34.2	36.0	6.0	6.0	6.0	6.0	6.0	6.0

SIRINDHORN PROJECT

SIMULATION OF RESERVOIR OPERATION

CAPBILITY (MW)

YEAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
1955	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.8	34.8
1956	34.0	33.6	33.8	34.5	35.7	36.0	36.0	36.0	36.0	36.0	36.0	35.8
1957	35.0	34.4	34.1	34.1	35.5	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1958	36.0	35.5	34.9	34.8	35.8	36.0	36.0	36.0	36.0	36.0	36.0	35.7
1959	34.8	34.2	33.6	33.5	34.3	36.0	36.0	36.0	36.0	36.0	35.6	34.6
1960	33.7	33.3	33.2	33.3	35.4	35.1	36.0	36.0	36.0	35.6	34.6	33.7
1961	33.2	33.2	33.2	33.9	35.9	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1962	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1963	35.6	34.9	34.3	34.1	35.4	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1964	36.0	35.6	35.2	34.7	35.3	36.0	36.0	36.0	36.0	36.0	36.0	35.2
1965	34.3	33.7	34.1	35.4	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.6
1966	34.7	34.6	34.8	35.9	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1967	35.0	34.4	34.0	34.2	35.4	36.0	36.0	36.0	36.0	36.0	36.0	35.8
1968	34.9	34.3	33.7	33.3	35.9	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1969	35.4	34.8	34.5	35.3	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.5
1970	34.6	34.0	34.1	35.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.9
1971	35.1	34.7	35.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1972	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1973	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	35.9	34.9
1974	34.3	34.4	34.5	34.6	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1975	35.4	35.3	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1976	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
1977	36.0	35.5	34.8	34.4	35.3	36.0	36.0	36.0	36.0	36.0	36.0	35.9
1978	35.1	34.7	34.6	35.4	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0

ประวัติการศึกษา

ชื่อ นาย สุวิทย์ ชโนภานุรัฬน์

วุฒิการศึกษา จบ มศ.5 จากโรงเรียนอำนวยศิลป์ พระนคร พ.ศ.2514

สำเร็จวิศวกรรมศาสตร์บัณฑิต

คณะวิศวกรรมศาสตร์ มหาวิทยาลัยเกษตรศาสตร์

ปี พ.ศ.2518

เข้าศึกษาในคณะวิศวกรรมศาสตร์ สาขาวิศวกรรมโยธา

ภาควิชาวิศวกรรมโยธา จุฬาลงกรณ์มหาวิทยาลัย

เมื่อปี พ.ศ. 2521