CECW-EH-W Engineer Regulation 1110-2-248	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	ER 1110-2-248 13 March 1981
	Engineering and Design REQUIREMENTS FOR WATER DATA TRANSMISSION USING GOES/DCS	
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DEPARTMENT OF THE ARMY
Office of the Chief of Engineers
Washington D.C. 20314

ER 1110-2-248

DAEN-CWE-HW

Engineer Regulation
No. 1110-2-248

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Engineering and Design
REQUIREMENTS FOR WATER DATA TRANSMISSION USING GOES/DCS

1. Purpose. This Engineer Regulation establishes the requirements for data transmission and retrieval via the Geostationary Operational Environmental Satellite (GOES) Data Collection System (DCS) operated by the National Earth Satellite Service (NESS) of the National Oceanic and Atmospheric Administration (NOAA).

2. Applicability. This regulation applies to all field operating activities having Civil Works responsibilities.

3. References.

a. ER 1110-2-240

b. ER 1125-2-308

4. Background. NOAA/NESS operates three Geostationary Operational Environmental Satellites, the eastern satellite positioned at 75 west longitude, the western satellite positioned at 135 west longitude, and a spare satellite positioned at 105 west longitude to provide backup for both the east and west satellites. A number of channels on the GOES/DCS have been dedicated by NESS for the exclusive use of the Corps of Engineers. Presently, the channels for "self-timed transmissions" are: 7, 17, 35, 55, and 67. An additional channel, 53, has been requested for data transmission using "random reporting" at data collection stations. Self-timed transmissions are routine and time ordered. Random transmissions may be activated only after threshold levels of parameters have been exceeded, or they may occur routinely at random intervals.

5. Requirements. The use of GOES is limited to relaying environmental data. Operational data, such as number of lockages, number of tows within a given system, gate settings, etc., are not allowed to be transmitted via GOES. In-situ environmental data are transmitted through data transmitters deployed at gage sites. All data transmitters that use the GOES/DCS must be certified by NOAA/NESS. To maintain system integrity, it is essential that each water data station operate only on the assigned frequency and time slot. In the event of malfunction in either the frequency or time slot, the field office having control over the station shall immediately turn off the transmitter and take proper corrective action. Each occurrence of transmitter malfunction should be reported immediately to the Water Resources Support Center (WRSC-C) by telephone (202) 325-0670 at Fort Belvoir, Virginia 22060, (Exempt under Paragraph 7-2o, AR 335-15).

6. Station and Channel Identification Number Assignments. For each self-timed field station, a time slot on any of the dedicated channels must be assigned. All Corps of Engineers users of GOES/DCS must obtain a channel assignment, a transmission time slot when applicable, and an identification number for each water data station from WRSC-C. ENG Form 4654-R(Appendix A) must be completed and submitted to WRSC for this purpose through the appropriate division office. For self-timed stations, the time slots on any designated channel are normally assigned in either two or four hour reporting intervals. A one hour reporting interval will be considered for approval in special cases when supported by adequate justification. Also, special time slots are reserved for station testing and for temporary (research) stations to transmit as often as 15 minutes. Assignment of time slots for random reporting stations is not required, however, station identification and channel numbers are required. ER 1125-2-308 prescribes the procedures that are to be followed in applying for these assignments from WRSC-C. Corps users are cautioned that no transmissions, including tests, are allowed prior to compliance with this ER, and approval by HQDA (DAEN-CWE-HW) WASH DC 20314.

7. Receive Sites. Data transmitted by GOES/DCS are received by NOAA/NESS. The Corps also has a functional received site at the Waterways Experiment Station (WES), formerly located at Lower Mississippi Valley Division (LMVD), capable of receiving data from the Corps water data stations. Proper arrangements with WES must be made to receive data from the system. A second Corps receive site at the New England Division, Waltham, Massachusetts may be operational in 1981.

8. Protocol for accessing Data from NOAA/NESS. GOES data in ASCII code (i.e. raw form) can be accessed from NOAA/NESS using a remote computer terminal equipped with a 300 or 1200 baud asynchronous telecommunication data set. A user identification number may be obtained directly from NOAA/NESS, by telephone (FTS 763-8325). NOAA/NESS will enter a station on their system upon receipt of request from the Corps of Engineers. Data at NOAA/NESS can also be accessed by a computer terminal equipped with a 2400 baud synchronous telecommunication data set. A cyclic redundancy character - 16 (CRC - 16) method should be used for data accessed through the 2400 baud synchronous dial-in-line. The protocol for accessing data from NOAA/NESS using the asynchronous system is shown in Appendix B. Any written coordination with NOAA/NESS must be channeled through the appropriate division office to WRSC-C. An information copy of all the correspondence must be furnished to HQDA (DAEN-CWE-HW) WASH DC 20314.

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1 The present software facilities at NOAA/NESS are limited for access to the 2400 baud line by Corps offices. Field offices planning to use this line for data access should contact WRSC-C for further information.

9. Accessing Data from the Receive Site at WES. GOES data in "engineering units" can be accessed from the receive site at WES using remote computer terminals (See Appendix C). Corps offices wanting to obtain their data through the receive site should contact that office for a user identificaton number and the procedure to follow for obtaining the desired data. The receive site will need the following information to enable them to convert the raw data to engineering units:

(a) A copy of the approved ENG Form 4654-R for each water data station.

(b) Parameters measured, measurement interval, reporting order, and type of sensor monitored (i.e., digital or analog sensors).

(c) High and low values in engineering units for parameters measured with analog sensors to enable conversion from voltage to engineering units.

10. WRSC Responsibility. The WRSC is responsible for maintaining an accurate record of Corps GOES/DCS users, and channel and time slot assignments through submittals of ENG Form 4654-R. Consequently, additions and revisions of Corps stations on GOES/DCS will be reported promptly to WRSC-C by updating ENG Form 4654-R. Revisions of the data on the form should show only the changes that have occurred since the last submittal.

11. Additional Assistance. Division engineers are responsible for overall coordination with and assistance to their appropriate district offices. If further assistance in technical details is needed, the FOA's may contact the Water Resources Support Center. Questions relating to policy matters should be addressed to HQDA (DAEN-CWE-HW) WASH DC 20314.

FOR THE CHIEF OF ENGINEERS:

FORREST T. GAY, III
Colonel, Corps of Engineers
Executive Director, Engineer Staff

3 Appendixes
APP A - ENG Form 4654-R
APP B - Procedure
APP C - Procedure

DATA TRANSMISSION REQUEST
GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE
DATA COLLECTION SYSTEM (GOES/DCS)
(ER 1110-2-248/ER 1125-2-308)

ACTION REQUESTED
☐ NEW ☐ DEACTIVATE
☐ RELOCATE ☐ CHANGE

PART I

1. STATION NAME

2. GENERAL	a. State & County	b. District and NET
c. Station Latitude (deg N)	d. Station Longitude (deg W)	e. Ground Elevation (FT MSL)
f. Satellite Longitude (deg W)	g. Date Submitted	
3. DATA TRANSMITTER TYPE/MFG	a. Data Transmitter Model No	b. Type ☐ Emergency ☐ Self Timed ☐ Interrogatable ☐ Random–Continuous ☐ Random–Threshold
c. Power Emission	d. Station Class	
e. Emission Bandwidth/Modulation	f. Deviation	g. Transmission Interval ____hrs ____min
4. ANTENNA MFG AND MODEL		a. Antenna Type
b. Antenna Gain	c. Beam Width	d. Polorization
e. Antenna Azimuth	f. Antenna Elevation	g. Antenna Height

5. REMARKS

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6. CONTACT NAME (PART I)	7. PHONE (Comml.)	PHONE (FTS)

(REMAINDER OF PART I WILL BE COMPLETED BY WRSC-C

8. INITIAL REPORTING TIME Local GMT	9. FREQUENCY/CHANNEL (Self-Timed)	10. STATION IDENTIFICATION NO (Self-Timed)
11. SERIAL NUMBER	12. FREQUENCY/CHANNEL (Random)	13. STATION IDENT (Random)
14. APPROVED	15. REQUEST DATE	

PART II

1. STATION IDENT NO. (OWDC)	2. POWER SOURCE ☐ AC ☐ DC

3. RIVER BASIN

4. PARAMETERS/TIME PERIOD BETWEEN MEASUREMENTS (hrs)

	☐ ____/____HR		☐ /____HR
☐ STAGE/____HRS	☐ ____/____HR	☐ ____/____HR	☐ /____HR
☐ PRECIP/____HRS	☐ ____/____HR	☐ ____/____HR	☐ BATTERY VOLTAGE/____HR

5. MESSAGE FORMAT	6. MAXIMUM MESSAGE LENGTH

7. OTHER SOURCES OF STATION DATA
☐ None ☐ Courier ☐ Mail ☐ Other ____

8. Telecommunication Line ☐ Digital ☐ Voice
Ground Based Radio ☐ Digital ☐ Voice
Recording at Station ☐ Type ____

9. SITE OF GOES RECEIVE STATION (Primary and Back-Up)
☐ NESS ☐ WES ☐ NED ☐ ORD
☐ ☐ ☐ ☐ OTHER

10 COMMUNICATION BETWEEN USER AND RECEIVE SITE
a. Type of Line ☐ Dial Up ☐ Dedicated
b. Transmission Rate (BAUD)
☐ 110 ☐ 300 ☐ 1200 ☐ 2400 ☐ 4800 ☐ Other ____

11. CONTACT NAME (PART II)	12. PHONE (Comml.)	PHONE (FTS)

ENG FORM 4654-R, Jan 81

PROCEDURE TO ACCESS CORPS WATER DATA ON GOES FROM NESS USING 300 OR 1200 BAUD

To Access Data

USER:	80 (202) 899-6595
SYSTEM:	DCS ENTER ID
USER:	COE001 or COE002 (Most stations are on file COE001)
USER:	RETURN
SYSTEM:	SIGN ON @ JULIAN DAY HR MIN SEC
SYSTEM:	NUMBER OD DISSEMINATED MESSAGES
SYSTEM:	TIME OF LAST DISSEMINATION
SYSTEM:	ENTER: MSG, GRL, DIS, or STOP
USER:	RLT/CE, JULIAN DAY HR MIN SEC (in Zulu, 9 digit number without spaces or commas, data for all Corps stations will follow unless you intercede or terminate)
USER:	RETURN

To Intercede

USER:	BREAK (4 to 5 sec)
SYSTEM:	ENTER: MSG... etc.
USER:	RLT/CE, JULIAN...etc (to start getting data at another time and/or day)
USER:	RETURN

To Terminate

USER:	BREAK
USER:	STOP

Example of Sign-On

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DCS - ENTER ID. COE001
COE001  SIGNON AT 177150653
NUMBER OF UNDISSEMINATED MESSAGES 0000
TIME OF LAST DISSEMINATION  177145725
ENTER: MSG,RLT,DIS, OR STOP RLT/CE,033000000
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APPENDIX C

PROCEDURE TO ACCESS CORPS WATER DATA ON THE GOES SYSTEM FROM THE LMVD RECEIVE SITE LOCATED AT WES

Set I/0 terminal at 300 baud (30 cps).

Dial FTS 542-2876 or commercial (601) 634-2876 on your data set to get on line.

System/User	Responses	Remarks
System:	(1) *LMVD/DC - ENTER USER ID:	
User:	(2) 1A (press RETURN key)	Type user ID assigned to you
	CORPS OF ENGINEERS ENVIRONMENTAL DATA STATIONS (EDTS) TRANSMITTED VIA GOES/DCS DATE: XX/XX/XX DAY: XXX TIME: XX:XX:XX CST	
System:	(3) *READY*	
USER:	(4) (one of the following) (press RETURN key)	Choose S, A, or U option, type appropriate date, station, and time, then press RETURN key.
	Time slice option. If omitted will access entire day requested S GS251 CE40FF58/1200 1455 3 digit Julian date; 8 digit EDT ID No.; 4 digit Start time; 4 digit Stop time	S option to access data for a single station. (Data may be requested for up to 7 Julian dates prior to current date. Time slice option allows data to be accessed between start time and stop time. These instructions apply to all options (A, S, U))
	A GS251/1200 1455	A option to access all data
	U GS251/0800 1400	U option to access data for a particular District or for those stations associated with a particular user ID.
System:	(5) (Lists data) (6) *END OF DATA (7) *READY	
User:	(8) To request data for another date or another EDT, repeat line (4) with new Julian date and/or new station ID.	
	(9) To change remote user's file ID "C". (10) To print a message to the log file "M". (11) To limit output to a certain number of lines L03U GS251/0800 1400 where L03 limits output to 3 lines of data. (12) To sign off, hold control key down and press "D" key (failure to do so may "Hang up" system.)	

NOTES: Data are transmitted in engineering units to users from Vicksburg via landline at 300 baud (30 cps). The procedure for accessing data via 2400 baud is available upon request. If any problem is encountered in accessing the data, call Mr. WM (Bill) Ring, WESJO, FTS 542-3286 or commercial (601) 634-3286. Mr. Ring should also be informed by telephone when approved water data stations are placed on-line in the system. The Chief, River & Reservoir Control Center, LMVED-WR, may be contacted regarding overall management of automated data collection and processing activities performed by the Receive Site, FTS 542-5887 or commercial (601) 634-5887.