DRAFT GOES High Data Rate Transition Plan

Comments back to kshelley@fs.fed.us by no later than: _____

I. BACKGROUND

The first Data Collection System (DCS) transponder was flown on the NOAA GOES satellite in the late 1970's. This resource was available to NOAA agencies initially, but was soon opened to other U.S. government agencies when excess capacity was available. Now GOES DCS has become a critical resource to many agencies, and to the environmental community as a whole. The capacity of the system is stretched due to conservative assignment policies deemed necessary to protect the operational integrity and reliability. In the early 1990's the STIWG and associated users community identified the need for additional capability for data throughput. The STIWG commissioned Cyberlink to study the feasibility of transmitting data through the GOES satellite at baud rates higher than 100 bps. The results of the study lead STIWG to initiate a development contract, managed by NOAA/NESDIS to engineer high data rate demodulators and transmitters. As a result, the GOES DCS is undergoing a transition to new technology which will affect the allocation of the available resources through the user community.

II. PURPOSE

With the delivery and implementation of the HDR systems, the STIWG appointed a Task Group to produce a transition plan. STIWG asked the group to develop a method to ensure the most efficient use of the resource with minimal impact to the user community. This plan provides guidance to NOAA/NESDIS personnel in allocating the resources and to the users in preparing for this transition.

III. FACTORS CONSIDERED IN ALLOCATING THE RESOURCE

A. **Spacecraft Loading** – NOAA/NESDIS commissioned a study to provide guidelines to ensure that spacecraft power limitations are not exceeded. This study provided various combinations of simultaneous transmissions (100/300/1200 baud), and the associated possible signal to noise ratio and resulting possible data loss if these limits are exceeded.

The analysis showed that there appear to be no limitations in the number of simultaneous transmissions that can be received by the NOAA CDA at Wallops. However, with the current GOES satellites, operators of Direct Readout Ground Stations (DRGS) with smaller receive antennas may find limitations as the system loading increases. The GOES N satellite series will provide increased power capacity and should facilitate better reception at smaller DRGS systems with smaller antennas.

B. **System Characterization** - The task group identified the need to characterize the loading of the current system and to identify future user requirements. Underutilization of existing resource was identified and some users were able to

reduce window length of current assignments to better utilize existing resources. The information assisted in developing the transition plan that would assist in the migration from ldr to hdr with minimim impact to the user community.

C. **Survey** –A web-based survey was developed to obtain information about users' plans for current assignments and any known future requirements. Based on the survey it was determined that using the existing bandwidth allocated to DCS, that….. *** **Completion of this portion and accuracy dependent upon participation in survey by user community.** ***

IV. RESOURCE ALLOCATION STRATEGY

A. As a guideline, each participating agency is requested to reduce their total number of 100 baud assignments by 15% each year, with the goal of full transition to HDR by December 2013.

B. Limited numbers of 100 baud assignments may be available through NESDIS through May 31, 2003. After May 31, 2003:

1. NESDIS policy states that there will be no new 100 baud assignments given. Exceptions to the rule must be approved by NESDIS, but in no case will new ldr assignments be given on channels higher than 100. 100 baud assignments will be continually compressed into lower channels (initially below channel 100).
    - Users are asked to move to 300 baud or move their 100 baud assignment to a channel below 100 by 12/2005.

C. One channel must be completely free of transmission between 100 and 300 division.

D. No intermixing of 100/300 baud on the same channel.

E. No 100 baud assignments will be made on channels greater than 100.

F. All High Data Rate (300/1200 baud) transmitters must use GPS.

G. It is noted that system capacity is impacted by the signal strength of each transmitting DCP. Users are asked to operate their system with nominal power levels as defined in the certification standards **(value* - value *)**. In case of deviation from these standards, users are asked to contact respective vendors for correction.

H. Users are asked to begin transmissions in the first part of the window rather than centering the message. This will facilitate analysis of system loading as it increases and allow flexibility in adjusting transmission window sizes as necessary.

    a. Unless justification is approved by NESDIS no assignments larger than 15 seconds at 300 baud will be allowed.

I. The priority for use of the 1200 baud rests with the agencies that requested 1200 baud be developed (NOAA agencies). Users may request 1200 but the final decision rests with NOAA/NESDIS.

V. CONVERSION TIMELINE

The DCS bandwidth includes channels 1 through 200. The following is a schedule of conversion to 300 or 1200 baud.

- Channels 140 – 179 Conversion Complete
- Channels 130 – 139 Conversion to be completed by June 2005.
- Subsequent channels will be cleared starting with channel 129, continuing in descending order at a rate of at least 10 per year.

- NESDIS will provide no new 100 baud assignments past May 31, 2003 unless, on a case-by-case basis a user justifies a special need to NESDIS. After this date, no 100 baud assignments will be given on channels higher than 100. One hundred baud assignments are always subject to availability.

- NESDIS will provide 300 baud assignments on channels 1-159 subject to channel and demodulator availability. One hundred and 300 baud adjacent channels will be separated by a guard band or unused channel.