

SUBMARINE BATTERY QUARTERLY REPORT
 NAVSEA 9320/3 (REV. 12-80) **S/N 0116-LF-093-2017**

NAVSEA RPT 9320-1

From: Commanding Officer, USS _____ To: Commander, Naval SEA Systems Command (SEA 5433) Washington, D.C. 20362 Requiring Document: Naval Ships Technical Manual Chapter 223, Vol. 1	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:33%;">DATE OF SUBMISSION</td> <td style="width:33%;">QUARTERLY CHECK (Check one)</td> <td style="width:33%;">YES NO</td> </tr> <tr> <td>DATE OF INITIAL FILLING</td> <td>PROP. MTR. & GEN. AMMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td>DATE OF INSTALLATION</td> <td>BATTERY AMMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td>DATE OF ELECTROLYTE ANALYSIS (SEMI-ANNUAL)</td> <td>BATTERY A-H METERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>PROP. MTR. & GEN. VOLTMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>BATTERY VOLTMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>INDIVIDUAL CELL VOLTMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>BATTERY AIRFLOW METERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>HYDROMETERS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> <tr> <td></td> <td>HYDROGEN DETECTORS</td> <td><input type="checkbox"/> <input type="checkbox"/></td> </tr> </table>	DATE OF SUBMISSION	QUARTERLY CHECK (Check one)	YES NO	DATE OF INITIAL FILLING	PROP. MTR. & GEN. AMMETERS	<input type="checkbox"/> <input type="checkbox"/>	DATE OF INSTALLATION	BATTERY AMMETERS	<input type="checkbox"/> <input type="checkbox"/>	DATE OF ELECTROLYTE ANALYSIS (SEMI-ANNUAL)	BATTERY A-H METERS	<input type="checkbox"/> <input type="checkbox"/>		PROP. MTR. & GEN. VOLTMETERS	<input type="checkbox"/> <input type="checkbox"/>		BATTERY VOLTMETERS	<input type="checkbox"/> <input type="checkbox"/>		INDIVIDUAL CELL VOLTMETERS	<input type="checkbox"/> <input type="checkbox"/>		BATTERY AIRFLOW METERS	<input type="checkbox"/> <input type="checkbox"/>		HYDROMETERS	<input type="checkbox"/> <input type="checkbox"/>		HYDROGEN DETECTORS	<input type="checkbox"/> <input type="checkbox"/>
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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
UIC					BATTERY TYPE					AGE (MONTHS)	FY RPT QTR	FISCAL YEAR	FIRST RPT	FINAL RPT	MONTHS ON OPEN CIRCUIT				

A-BATTERY UPKEEP

	WATER USED (GALLONS)	AMP-HOURS CHARGED (CALCULATED)	CYCLES (1)	NUMBER OF CHARGES			AMP-HOURS CHARGED (A-H METER)	AMP-HOURS DISCHARGED (A-H METER)										
				NORMAL	EQUALIZING	PARTIAL												
LAST REPORT			•															
FIRST MONTH			•															
SECOND MONTH			•															
THIRD MONTH			•															
TOTAL				21	22	23	24	25	26	27	28	29	30	31	32	33		

(2)

B-DATA AT END OF EQUALIZING CHARGE

DATE			BATTERY VOLTS CORRECTED TO 80° F (3)	CORRECTED SP. GR. (AVERAGE) (4)	CELLS 10 POINTS BELOW OR ABOVE AVERAGE SP. GR. (CONTINUE IN REMARKS SECTION)				FOUR LOWEST CORRECTED INDIVIDUAL CELL VOLTAGE (5)			
MO.	DA.	YR.			CELL	SP. GR.	CELL	SP. GR.	CELL	SP. GR.	CELL	SP. GR.
			34 35 36 37									
			42 43 44 45									
			50 51 52 53									
			58 59 60 61									

DATE			BATTERY DISCHARGE RATE (6) (AMPERES)	ACTUAL TIME (MIN) (7)	AGE IN CYCLES (8)	AVG. PILOT CELL TEMP. AT START AND END		RATED TIME (MIN) (9)	ACTUAL CAPACITY (PERCENT) (10)	NO. OF CELLS JUMP-ERED	FINAL VOLTS					
MO.	DA.	YR.				START	END				TOTAL	THREE LOWEST CELLS				
6	6	6	6	6	7	7	7		72	73	74	75				
6	7	8	9	0	1											

D-OTHER DATA AND SIGNATURE LINES

REMARKS(11)

COPY TO
 FORCE COMMANDER
 COMSUBRON _____
 BATTERY MFGR _____
 FILE _____

ENGINEERING OFFICER

 APPROVED BY _____
 COMMANDING OFFICER

(Numerals in parentheses refer to instructions on reverse side)

INSTRUCTIONS

(Instruction numbers refer to numerals in parentheses on front)

1. **CYCLES:** The total number of cycles is the ratio of the total ampere-hours of charge per battery, excluding the ampere-hours of initial charge, to the ampere-hours per cycle given as follows:

SARGO II	8200
All GUPPY's	5000

2. **DATA AT END OF EQUALIZING CHARGE:** When more than one battery is installed, an additional copy of this form is required for each additional battery. In these cases, only section B is completed and the form attached as page 2, 3, 4, etc.
3. **CORRECTED VOLTAGE:** The corrected voltage is the switchboard voltmeter reading corrected for the difference between 80°F and the average electrolyte temperature given by the pilot cells. For each cell in series, add or subtract 0.003 volt for each degree F above or below 80°F respectively.
4. **CORRECTED SPECIFIC GRAVITY:** The corrected specific gravity is the hydrometer reading, corrected for difference between 80°F and average electrolyte temperature given by the pilot cells and corrected for difference between normal level and actual electrolyte level. The specific gravity must be corrected:

a. **For temperature:** Add or subtract 0.001 specific gravity for each 3°F if the temperature is above or below 80°F respectively.

b. **For electrolyte level:** For each inch above or below normal level add or subtract respectively the following specific gravity corrections:

SARGO II	0.008
GUPPY I (LA)	0.012
GUPPY I MOD A (LA)	0.008
ALL CALCIUM GUPPY's	No correction

5. **INDIVIDUAL CELL VOLTAGE:** Cell voltage as read on the individual cell voltmeter, corrected for cell temperature (see inst. 3).
6. **BATTERY DISCHARGE RATE:** The battery discharge rate must be held constant throughout the capacity discharge test. It is given in the following table for each specific battery type.

Battery Type	Rate (Amps)
Antimony	
SARGO II	6 hr.-rate 1735
GUPPY I (LA) AND MOD A (LA)	1045
Calcium	
GUPPY I (LC), MOD A, MOD B	3 hr.-rate 1835
GUPPY I MOD C (LC)	1750

Where batteries are discharged in parallel, the total current may not be equally divided. In this case, use the average discharge current (calculated from the ampere-hour readings divided by the discharge time) to determine the rated time of discharge from the "Battery Curves and Data" in the appropriate Battery Service Manual.

7. **ACTUAL TIME:** The actual time of discharge (in minutes) is the duration of the discharge to the limiting voltage, total battery or individual cell, whichever occurs first. These voltages are tabulated on the plan, "Battery Curves and Data," in the appropriate Battery Service Manual.

8. **AGE IN CYCLES:** The number of cycles is computed using inst. 1.

9. **RATED TIME:** The rated time of discharge at 80°F is:
 360 minutes for Antimony batteries (6 hr-rate)
 180 minutes for Calcium batteries (3 hr-rate)
 The rated time must be corrected:

a. **For temperature:** Determine the average temperature of the pilot cells at the start of the discharge and apply the correction according to the "Battery Curves and Data" plan.

b. **For cycle age:**

Calcium-grid batteries: No correction for cycle age.

Antimony-grid batteries: Make correction by multiplying the rated time of discharge by the factor F given by the following, where C is the age in cycles.

Type	When C is less than	Factor F
SARGO II	50 cycles	$0.9 + 0.1C/50$
GUPPY's (LA)	30 cycles	$0.9 + 0.1C/30$

10. **ACTUAL CAPACITY:** Actual capacity in percent is computed from:

$$P\% = \frac{\text{Actual time (see inst. 6)}}{\text{Rated time (see inst. 8)}} \times 100$$

11. **REMARKS:** Any pertinent event or condition should be reported; i.e., a cell seriously different from other cells; a sizable split in charging currents and if corrected, identification of any cells jumpered out of the circuit (and reason for the action); unsatisfactory electrolyte analysis; special instructions or correspondence pertaining to the battery.

NOTE: Age in months is computed from the date of initial filling (not date of installation).