

Made a card relating
to recent detail of T-329
set up detail it to ask
10-29

(42689)

September 18, 1959

T-329 - RADIOLOGICAL URINALYSIS KIT

1429004-12 - Bottle
1429004-2
STANDARD
Bottle + 4 water

The following memorandum of understanding is forwarded to confirm our recent discussion and acknowledge the receipt of a copy of your trip report relative to the subject item.

Sand
138888-00
Sandia will
forward bottles

The T-329, Radiological Urinalysis Kit (tritium in urine) will be purchased as a stock item. Upon receipt at Bendix, Kansas City Division, the unit will be inspected, tested for vacuum leakage; a bottle containing metallic calcium and a bottle containing tritium water (250 microcuries) shall be permanently positioned in a bracket inside the T-329. This kit containing the bottled components will be packaged and shipped as required. Schedules indicate that four complete kits will be delivered in February, 1960 with rework of units and spares being considered at subsequent dates.

Metallic calcium will be purchased from a suitable vendor and must be qualitatively identified in the Test Laboratory.

Bottled (polyethylene) tritium water will be purchased from Sandia Corporation as a QALP-D item. Upon the receipt of bottles at Bendix, they will be usually inspected (unopened) and stored until permanently positioned inside of the T-329 kit and transhipped.

To assure adequate contamination controls, as verbally discussed with you on September 17, 1959, the following shall be initiated:

1. Forward a memorandum to the Manager, Health, Safety and Fire Departments indicating when you place your requisition and anticipate the receipt of the tritium water.
2. Inform the vendor that a note is to be placed on the exterior of the package containing bottled tritium water stating, "Not to be Opened - Contact Health, Safety and Fire Departments". OLED GAE 8024 - 14 BOTTLES
3. The bottled tritium water must be stored in an enclosure with a suitable exhaust available or external to the building.

Your cooperation in this matter is appreciated and we will provide any necessary services to assure adequate safety in your required operations.

[Redacted Signature]
Industrial Hygienist

cc: [Redacted]

DETERMINATION OF TRITIUM IN URINE AND WATER

ABSTRACT

The procedure utilizes equipment designed by Sandia Corporation. The essentials are: No. T-289 air sampler and vibrating reed electrometer and No. T-329 gas generating equipment. The tritium and hydrogen are liberated from the sample by dropping it on metallic calcium in an evacuated system. The gases flow into an ion chamber where the activity is measured with a electrometer.

EQUIPMENT AND REAGENTS

#10 mesh metallic calcium
High vacuum stop-cock grease
Glass generator bottles
Tritium standard
Glass cotton
Dessicant
Measuring spoon (1/2 TSP)
Concentrated nitric acid
Kerosene
Silicone Defoamer (Dow Antifoam A)
Cleaning Brushes

PROCEDURE:

- 1) Using the measuring spoon, place one measure of metallic calcium in a dry gas generator jar. On urine samples place a film of defoamer around the neck of the jar.
- 2) Apply a thin coat of grease to the gas generator jar, insert the top portion and turn under pressure to seal.
- 3) Check all stop-cocks in system for sufficient grease.
- 4) Place generator assembly on spring-loaded bracket. Depress bracket and mate ball and socket joint with grease.
- 5) Connect tubing to ionization chamber and open valve on the chamber.
- 6) Close stop-cock #4 on control panel and fill condenser with water.
- 7) Close stop-cock #3. Open stop-cock 1, 2, and ion chamber valve.
- 8) Turn on A-C power switch. Allow motor to run until vacuum gage indicates 20 on left hand scale (gage may have to be tapped lightly with finger to remove static friction from gage).
- 9) Open stop-cock #3 and keep open until gage returns to zero.
- 10) Repeat Nos. 8 and 9 three times to flush system. Close stop-cock #3.

- 11) Open stop-cock #1 and keep open until gage indicates 20. Close stop-cock #1, and check for leaks by observing the vacuum gage. If gage moves, apply more grease and check all joints.
 - 12) By controlling stop-cock #1 and the motor switch, evacuate to a reading of exactly 20. If the gage remains there, proceed to the next step.
 - 13) Pour the sample into the thistle tube on the gas generator until $3/4$ full.
 - 14) Carefully open stop-cock #3. Allow the sample to fall slowly on the calcium dropwise and when the gage falls to a reading of one inch of mercury (vacuum), close stop-cock #3.
 - 15) Allow the gage to go past zero to push the gas sample through the system.
 - 16) Close stop-cock #2 and disconnect the generator assembly using a towel to protect the hands.
 - 17) Open stop-cock #2 for a moment to allow the gage to return to zero. Now close ionization chamber valve.
 - 18) Turn attention now to the T-289. This procedure should be done before the analysis. Rotate the range selector to zero. Hold alarm switch in "off" position, then turn on power control.
 - 19) Allow one minute to warm up. Unlock zero adjust knob and rotate until the recorder reads zero. Lock zero control and release alarm switch.
 - 20) Wait 15 minutes, making zero adjustment as necessary.
 - 21) Rotate range selector to test. Recorder indicator will rise to within the range 7.4 to 9.4 in about one minute. Indicator then will gradually fall.
 - 22) Rotate range selector to zero, making an adjustment to zero on the recorder with zero adjust as necessary.
 - 23) The T-289 is now ready for use. Rotate the range selector to $\times 1000$. Wait a moment and if the recorder indicates less than 1, rotate to $\times 100$ scale. Repeat this procedure until the recorder indicates more than one. Most reading will be read on the $\times 10$ or $\times 1$ scales.
- Note: When rotating the range selector in a clockwise direction, depress alarm switch to "off" position.
- 24) Allow the T-289 to operate for 15 minutes and visually observe the reading after this time interval.
 - 25) The stability of this reading can be checked by repeating #26.
 - 26) Rotate range selector switch to zero position and flush the system. The instrument is now ready for the next analysis.

Calibration of standard curve:

- 1) Ascertain the present strength of the tritium water by referring to a graph provided. Prepare suitable standards from 5 - 250 microcuries per liter.
- 2) Pour a standard tritium into the gas generator and proceed thru the analysis as described above.
- 3) Plot the recorder reading obtained against the concentration of tritium as obtained in (1).
- 4) At least 2 points on the curve should be obtained plus a background on tap water. The Y intercept should be equal to the background.

Cleaning of equipment:

- 1) The vacuum pump is used to flush completely the ionization chamber and system after each analysis.
- 2) The gas generator and the gas generator jar are cleaned as follows:
 - 1) Rinse thoroughly in tap water.
 - 2) Add nitric acid to remove calcium stains.
 - 3) Soak in kerosene for several hours for hot samples.
 - 4) Rinse with water, then wash with soap and water.
 - 5) Rinse in distilled water and allow to dry.

The procedure is reported to have an efficiency of 40% and a precision of $\pm 5\%$ in the range 1 to 150 microcuries per liter.

INTERDEPARTMENTAL MEMO

DATE: April 14, 1967
TO: [REDACTED]
FROM: [REDACTED]
SUBJECT: WEEKLY ACTIVITIES, 3-27-67 to 4-15-67

Listing only of areas in the plant that we are having trouble getting required corrective action completed:

None

A few areas to keep you posted:

1. Engineering has obtained the research and development contract order for 20 T-446 tritium monitors. This will involve testing with approximately 100 curie Cesium-137 source. Sandia may do the testing. Sandia may provide source for us to use, or Bendix may have to purchase source for testing.
2. Have gotten with [REDACTED] in an attempt to get final report on [REDACTED] so we can settle his comp case that was started in 1962 because of his alleged TMI exposure. Have final report and evaluation from [REDACTED] and we have requested insurance carrier to attempt to negotiate a settlement.
3. They are planning to put two DXT X-ray units in Department 48 production areas to use as a quality control means to evaluate the amount of epoxy on paper honeycomb. We have evaluated the unit developed by Materials Engineering and [REDACTED] group, and tube position is fixed, beam is collimated and shielding is provided. Will need orientations and film badges for people but don't think this will be any problem.
4. We are making arrangements to obtain test forms and are preparing a bulletin for distribution relative to the 1967 National Drivers' Test that will be presented May 23, 1967 at 9:00 p.m. on Channel 5.

Please keep me posted on progress

*Volunteer
I say
with [REDACTED]
[REDACTED]
[REDACTED]
4/17/67*

*modified
[REDACTED]
agree if so good*

[REDACTED]

[REDACTED]

INTERDEPARTMENTAL MEMO

DATE: May 1, 1967

TO: [REDACTED]

FROM: [REDACTED]

SUBJECT: WEEKLY ACTIVITIES, 4-16-67 to 4-30-67

Listing only of areas in the plant that we are having trouble getting required corrective action completed;

None

A few miscellaneous areas:

1. We have been advised by Engineering that Sandia will do the testing on the twenty T-446 tritium monitors that they have obtained an order to develop. As a result, it appears that we will not have a 100 curie Cesium-137 source in the plant to test these units at this time.
2. Have received final report from [REDACTED] on [REDACTED] in (TDI exposure). Have gotten with insurance carrier and [REDACTED] in an attempt to negotiate a settlement, but it appears that [REDACTED] does not want to settle. Insurance carrier is going to go ahead and set up a hearing by routine procedure with the compensation commission.
3. Have gotten with [REDACTED] to get Executive Safety Committee meetings and plant inspections started. First meeting will be May 2, 1967.
4. As you suggested, I think it would be a very good idea to add an additional fellow in the area of Industrial Hygiene after the first of the year to perform laboratory work. In the event this individual were colored, it would make no difference if he were capable.

[REDACTED]

[REDACTED]



INTERDEPARTMENTAL MEMO

DATE: March 27, 1967

TO: [REDACTED]

FROM: [REDACTED]

SUBJECT: WEEKLY ACTIVITIES, 3-12-67 to 3-26-67

3/27
To help clarify
Area not classified
however, not that
of security clearance
is not in work

Listing only of areas in the plant that we are having trouble getting required corrective action completed:

None.

NOTE: Have been advised by Electronics Engineering that Bendix is trying to obtain a contract for a new Tritium Monitor, a T446. At the present time, Bendix and Victoreen Instrument Company are in contention for the work, with Bendix receiving a developmental order for 20 units. If we obtain the order, it would be a fairly large quantity of units. In making the units, it would involve using a radioactive Nickel-63 plating bath to plate the radioactive material on one of the components and it would also require using a Cesium-137 source of approximately 100 curies to test the unit. No definite plans are made at present; however, on the 20 units we make it is proposed to have Sandia test them with one of the hard gamma radioactive sources.

This is about all we know as of this date; however, believe we could set up an area to handle this source for unit testing without too much difficulty. We will try to keep you posted as we are advised of more information.

[REDACTED]

UNIT ASSY. T-329A
(CONTROL)

PL1429004

ISSUE
S

ASSY. NO.	USED ON	NEXT ASSY.	PAGE 1 OF 12
			PREP
			CHKD. 1-5-61
			APP.
			APP. 1-5-61

NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	PART NO.	ITEM	NAME	PL REV.
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PARTS TO BE PURCHASED UNDER APPLICABLE BKC PART NUMBERS BY BKC SUPPLIER TO MANUFACTURE PER THE APPLICABLE DRAWINGS AND SPECIFICATIONS LISTED ON SANDIA NX351874 ISSUE V, EXCEPT THAT ANY ADVANCE INFORMATION AND/OR EXCEPTIONS SHOWN ON THIS PARTS LIST ARE EFFECTIVE IN THE MANUFACTURE OF PARTS DEFINED BY THIS PARTS LIST:

EXCEPTIONS:

- 1429005 REPLACES TR351874
- 807384-66 REPLACES NX351891
- PL1429008-1 REPLACES NX135575
- PL1429012-1 REPLACES NX136154
- 588380-1 REPLACES NX131801
- ADD NX331321
- PL1429042-1 REPLACES NX331321
- OMIT: 132103, 132111, 132120, 132127, 132165, 136732, 136733, 136736, 136737, 136738, 136739, 136766, 136768, 136771, 136773, 136789, 136798, 136804, 142218, 801893, 811234, 817141, 829208, 830856, 832936, 832958, 833066, 833082, 833908, 852029, 852953, 852979.
- 351874 ISSUE L REPLACES ISSUE K
- 138988 ISSUE K REPLACES ISSUE J

(V DENOTES "AS REQUIRED" PER RATED ASSEMBLY)

THE Bendix CORPORATION
KANSAS CITY DIVISION KANSAS CITY, MO.

PL1429004

RELEASED TECH 1	RELEASED TECH 2	RELEASED TECH 3	RELEASED TECH 4	RELEASED TECH 5	RELEASED TECH 6	RELEASED TECH 7	RELEASED TECH 8	RELEASED TECH 9	RELEASED TECH 10	RELEASED TECH 11	RELEASED TECH 12
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DIST. 2 578

PL429004

ISSUE S

ASSY. NO. USED ON NEXT ASSY. PAGE 2 OF 12
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 CHKD.
 APP.
 APP.



NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	PART NO.	ITEM	NAME	PL REV.
		X	X	X	X	NX351874		UNIT ASSY, T-329A	
					X	1429005		TEST REQUIREMENTS	
					X	1429006		TEST INSTRUCTIONS	
					X	PL1429008-1		CARRYING CASE (CONTROL)	
					X	PL1429012-1		CARRYING CASE, SLEEVE (CONTROL)	
					X	607384-66		SA-183-66	
					X	598330-1		TERMINAL, STUD	
					X	351874		UNIT ASSY, T-329A	
				X		138988		WATER, TRITIUM	
				X		1429007		TEST INSTRUCTIONS	
			X			138986		CALCIUM, METALIC	
	X					136735		GLASS WOOL	
					X	PL1438942-1		T-2068 (CONTROL)	

(✓ DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE *Brady* CORPORATION
 KANSAS CITY DIVISION KANSAS CITY, MO.

PL429004

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PLI429004

ISSUE 5

ASSY. NO.

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NEXT ASSY.

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PREP: [REDACTED]

CHKD:

APP:

APP:

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-14

-13

NO

NO

NO

NO

NO

NO

PART NO.

ITEM

NAME

PL REV.

X

X

X

X

X

X

NX351874

UNIT ASSY, T-329A

135764

CONNECTOR

136802

CONDENSER

136761

CHAMBER, DRYING

136783

CHART, COMPARISON

X

136776

GENERATOR, GAS

X

136787

SPRING

(✓ DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE Bendix CORPORATION
KANSAS CITY DIVISION KANSAS CITY, MO.

RELEASED
ECON 4

RELEASED
ECON 4

RELEASED
ECON 7

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ECON 4

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ECON 4

DRY.

PLI429004

PLI429004 S

ISSUE

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NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	PART NO.	ITEM	NAME	PL REV.
			X	X	X	NX351874		UNIT ASSY, T-329A	
					X	136729		BRACKET, SLIDE	
				X		136730		BRACKET	
		X				136731		BRACKET, PUMP	

(V DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE *Beatty* CORPORATION
 KANSAS CITY DIVISION KANSAS CITY, MO

PLI429004

RELEASED ECH 1	RELEASED ECH 2	RELEASED ECH 3	RELEASED ECH 4	RELEASED ECH 5	RELEASED ECH 6	RELEASED ECH 7	RELEASED ECH 8	RELEASED ECH 9	RELEASED ECH 10	RELEASED ECH 11	RELEASED ECH 12
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PL429004

ISSUE S

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-37 -36 -35 -34

NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	NO REQ	PART NO.	ITEM	NAME	PL REV
X	X	X	X			NX351874		UNIT ASSY, T-329A	
			X			136740		HOLDER, BRUSH	
		X				136742		RING, CHAMBER	
	X					136751		PANEL, MOUNTING	
X						136753		BRACKET	

(V DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE *Brady* CORPORATION
KANSAS CITY DIVISION KANSAS CITY, MO.

PL429004

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PLI429004

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-39

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NO REQ

REQ

REQ

REQ

REQ

REQ

PART NO.

ITEM

NAME

PL REV

X

X

X

X

X

NX351874

UNIT Assy, T-329A

136754

BRACKET

136755

BOLT, SHOULDER

136756

SPACER

X

136757

HANDLE

X

136765

BRACKET

(V DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE *Bendix* CORPORATION
KANSAS CITY DIVISION KANSAS CITY, MO.

PLI429004

RELEASED
ECN 6

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ECN 7

RELEASED
ECN 8

RELEASED
ECN 9

RELEASED
ECN 10

RELEASED
ECN 11

RELEASED
ECN 12

RELEASED
ECN 13

RELEASED

CHST.

PLI429004

ISSUE 8

711

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			CHKD.			
			APP.			
			APP.			

NO REQ	NO REQ	NO REQ	NO REQ	NO REQ
	X	X	X	
			X	
		X		
X				

PART NO.	ITEM	NAME	PL REV.
NX351874		UNIT ASSY, T-329A	
136769		BRACKET, ANGLE	
136770		COVER	
136772		HOLDER, BOTTLE BRUSH	
136774		BAR, SLIDE	

(V DENOTES "AS REQUIRED" PER NOTED ASSEMBLY)

THE **Bendix** CORPORATION
 KANSAS CITY DIVISION KANSAS CITY, MO.

PLI429004

RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1	RELEASED ECH 1

CLASSIFICATION

BENDIX AVIATION CORP.
KANSAS CITY DIVISION - KANSAS CITY, MISSOURI

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PLI429004

ISSUE

3

- 1. SUPPLIER TO PLACE THE FOLLOWING NOTE ON EXTERIOR OF 1429004-2 PACKAGE: "NOT TO BE OPENED. CONTACT HEALTH, SAFETY AND FIRE DEPARTMENTS". STENCIL IN .25 INCH CHARACTERS WITH RED INK.
- 2. ONLY 138988-00 FROM 1429004-1 ASSY. THIS ITEM WILL BE PLACED IN THE ASSY BY BKC.
- 3. 1434002-1 BOTTLE MAY BE USED IN PLACE OF 138989; 1434001-1 BOTTLE IN PLACE OF 138987; AND 1434000-1 BOTTLE IN PLACE OF 136782 WHEN PURCHASING 1429004-2, -3, AND -7 RESPECTIVELY.

CLASSIFICATION

ISSUE

PLI429004

CLASSIFICATION

THE *Bendix* CORPORATION
KANSAS CITY DIVISION KANSAS CITY, MO.
PAGE 12 OF 12

PL 1429004

ISSUE
S

THE FOLLOWING ADVANCE INFORMATION SHALL APPLY IN THE MANUFACTURE OF THE ITEMS INDICATED. THIS INFORMATION WILL BE INCORPORATED IN DESIGN AGENCY DRAWINGS AT A LATER DATE.

2. ADDED BY EGN 7102922 (FROM ACO 331185 (42P3))

2.1 136783

2.1.1 SEC. C6 CHANGE "MAJOR DIVISIONS EQUALLY SPACED 1.00 APART, BOTH DIRECTIONS" "MINOR DIVISIONS EQUALLY SPACED 0.10 APART, BOTH DIRECTIONS" TO "MAJOR HORIZONTAL DIVISIONS EQUALLY SPACED 0.50 APART" "MAJOR VERTICAL DIVISIONS EQUALLY SPACED 1.00 APART" "HORIZONTAL MINOR DIVISIONS EQUALLY SPACED 0.10" "VERTICAL MINOR DIVISIONS EQUALLY SPACED 0.20 APART".

2.1.2 CHANGE DRAWING TO SHOW MAJOR AND MINOR DIVISIONS AS REQUIRED IN THE ABOVE CHANGE.

3. ADDED BY EGN 7103020 (FROM ACO 331185 (P4))

3.1 138988.

3.1.1- CHANGE NOTE 2, "INK STAMP....USING CARTERS NO. 682 INK" TO "INK STAMP....USING CARTERS NO. 456 INK."

3.1.2 CHANGE NOTE 6 "CORRECTIONS TO STRENGTH,..... USING CARTERS NO. 682 INK, AND ADDING..... USING CARTERS NO. 682 INK", TO "CORRECTIONS TO STRENGTH... USING CARTERS NO. 456 INK, AND ADDING..... USING CARTERS NO. 456 INK."

DIST.

PL 1429004

DATE July 28, 1972

SH
BIL
WE
NO
AU
BU

TO

Ingram Laboratories
3000 W. 135th St.
Leawood, Kansas 66209
Attn. [REDACTED]

HAZARDOUS MATERIAL

NOT APPLICABLE

YES

TYPE

OR CODE:

RETURN AUTH.

QTY	PART NO.	DESCRIPTION
		<p>Water samples to be analyzed for:</p> <ol style="list-style-type: none"> 1. Total Coliform Bacteria (#/100 ml) #2. 2. Fecal Coliform Bacteria (#/100 ml) #. 3. Fecal Streptococci (#/100 ml) #. 4. Total Organic Carbon (mg/l) .# 5. Radioactivity <ul style="list-style-type: none"> Gamma Total (µic/l) #. Gamma Counting Error (µic/l) #. Tritium - Total (µic/l) .# Tritium Counting Error (µic/l) .# <p>*Significance requested in reporting data *Please return Tallon bottles containing samples</p> <p>Please forward written report to [REDACTED] Zandix, A. G., No. 301-3011 ext. 2505 Samples being forwarded on Requisition #153101</p>

TRANSPORTATION ON REPLACEMENT OF REJECTED MATERIAL MUST BE PREPAID AND ALL

Material is being returned against Purchase Order No. _____ and is NOT to be re
 Material was inspected to print issue _____, and rejected by reason of the discrepan
 R. No. _____, and is returned for credit against Purchase Order No. _____,
 Payment is to be against this same Purchase Order number in accordance with shipping sched

DEBITS			CREDIT		
VO. NO.	A/C NO.	AMT.	A/C NO.	AMT.	