

Cardinal Health 414, LLC
Quality & Regulatory
7000 Cardinal Place
Dublin, OH 43017
tel 614.757.4120
fax 614.652.4598

www.cardinalhealth.com



February 21, 2020

Bryan Parker
U.S. Nuclear Regulatory Commission
Region III – Division of Nuclear Materials Safety
2443 Warrenton Rd, Suite 210
Lisle, IL 60532-4352

RE: Amendment Request for License 34-31473-03MD, Cardinal Health, Dublin, OH.

Licensing:

Cardinal Health 414, LLC (Nuclear Pharmacy Services, hereafter Cardinal Health) requests an amendment for the above referenced license to add the following non-pharmacist authorized users (AU) for research and development: Andrew B. Hughes, and John Daniel Glenn. Documentation of training is enclosed.

If you have any questions regarding this request, please contact me at 614.757.9586.

Sincerely,

Glenn Sullivan
Corporate Radiation Safety Officer
Director, Health Physics
Nuclear & Precision Health Solutions

Enclosure: Training Documents

cc: Benjamin Ellert, PRSO, Loc. 7220
Adam Timm, Loc. 7220
Keith Koontz, Loc. 10
Katherine Benson
License File 7220 (3)

RECEIVED FEB 26 2020

RADIOISOTOPE HANDLING EXPERIENCE

Name: John Daniel Glenn Date: 02/18/2020

Document the actual use/handling of radioactive material under the supervision of an Authorized Nuclear Pharmacist.

ISOTOPE	MAXIMUM ACTIVITY HANDLED	USE See key below: 1,2,3,4,5,6,7	EXPERIENCE Actual clock hours (Include date range of experience)	WHERE EXPERIENCE GAINED
Co-57	5.403uCi	1,2	October 2013 – Present 55,632 Hours	Cardinal Health
Cs-137	194.7 uCi	1,2	October 2013 – Present 55,632 Hours	Cardinal Health
F-18	20 Ci	1,2,3,4,5,6	October 2013 – July 2019 50,232 Hours	Cardinal Health
Na-22	236 uCi	1,2	October 2013 – Present 55,632 Hours	Cardinal Health
Ac-225	1.3 mCi	1,2,3,4,5,6	July 2019 – Present 5400 Hours	Cardinal Health
In-111	90 mCi	1,2,3,4,5,6	July 2019 – Present 5400 Hours	Cardinal Health
Tc-99m	105 mCi	1,2,3,4,5,6,7	July 2019 – Present 5400 Hours	Cardinal Health

Key for "Use": the number, or numbers, entered under "Use" should correspond to the handling experience for each isotope.

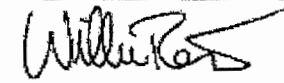
1. Ordering, shipping, receiving radioactive materials and performing related radiation surveys
2. Calibrating, using and performing checks for proper operation of dose calibrators, scintillation

TRAINING RECEIVED IN BASIC RADIOISOTOPE HANDLING TECHNIQUES

Name: John Glenn

Location of Training	Date(s) of Accordance	Course Title	Total Clock Hours of Course	BREAKDOWN OF COURSE CONTENT IN CLOCK HOURS*				
				Radiation Physics & Instrumentation	Radiation Protection	Math Pertaining to Radio-activity	Radiation Biology	Radiopharmaceutical Chemistry
CARDINAL HEALTH DUBLIN, OH	4/21/2014- 6/2/2014	CARDINAL HEALTH AUTHORIZED USER EDUCATION PROGRAM	200	85	58	25	32	0
*Note: Show a breakdown of hours by institution, dates, and subjects. List each hour only once (i.e., under the most applicable subject category)		TOTAL HOURS	200	85	58	25	32	0

Signature:



Corporate Radiation Safety Officer

Date: 6/4/2014



**LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL COMPLIANCE
RADIATION LICENSING
P.O. BOX 4312
BATON ROUGE, LOUISIANA 70821-4312**

RADIOACTIVE MATERIAL LICENSE

Pursuant to the Louisiana Environmental Quality Act (Louisiana Revised Statutes 30:2101 et seq.) and the Louisiana Radiation Regulations, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess and transfer radioactive material for the purpose(s) and at the place(s) designated below. This license shall be deemed to contain the conditions specified in the Louisiana Revised Statutes 30:2105 of the Louisiana Nuclear Energy and Radiation Control Law, and is subject to all applicable rules, regulations, and orders of the Department now or hereinafter in effect, including the Louisiana Radiation Regulations (LAC 33:XV) and to any condition specified in the license.

LICENSEE Cardinal Health 414, LLC 7000 Cardinal Place Dublin, Ohio 43017 Attention: Glenn Sullivan Corporate Radiation Safety Officer	LICENSE NUMBER LA-13323-L01	EXPIRATION DATE January 31, 2021
	PREVIOUS AMENDMENTS ARE VOID AMENDMENT NUMBER 6	AI NUMBER 199589
	THIS LICENSE ISSUED PURSUANT TO AND IN ACCORDANCE WITH Letter SIGNED BY: Glenn Sullivan DATE: June 3, 2019	

RADIOISOTOPE		MAXIMUM NUMBER OF SOURCES	MAXIMUM ACTIVITY OR QUANTITY PER SOURCE*	SEALED SOURCE IDENTIFICATION		STORAGE CONTAINER OR EXPOSURE DEVICE	
ELEMENT	MASS NO.			CHEMICAL FORM—PHYSICAL STATE		AUTHORIZED USE	
H	3	Total	40 mCi	Liquid		Product resulting from activation of O-18 water	
C	11	Total	5 Ci	Any		Production and Distribution to Specifically Licensed Recipients	
N	13	Total	20 Ci	Any		Production and Distribution to Specifically Licensed Recipients	
O	15	Total	5 Ci	Any		Production and Distribution to Specifically Licensed Recipients	
F	18	Total	60 Ci	Any		Production and Distribution to to Specifically Licensed Recipient	
Na	22	Total	20 mCi	Any Approved Commercially Available Calibration or Reference Source		Calibration or quality checks	
Tc	99m	Total	5 Ci	Any		Calibration of instruments	

*pCi-picocurie; μ Ci-Microcurie; mCi-Millicurie; Ci-Curie

Lourdes Iturralde
Assistant Secretary

DATE

6-19-19

Page 1 of 4 Page(s)

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIOACTIVE MATERIAL LICENSE

LICENSEE	LICENSE NUMBER	AMENDMENT NUMBER	AI NUMBER	
Cardinal Health 414, LLC	LA-13323-L01	6	199589	Page 2 of 4 Page(s)

Any radioactive material atomic number 3-83	** **	Solid or solid sources	Calibration, leak testing reference sources and redistribution
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Any 1-83 (Except SNM*)	As produced by operation of Cyclotron	Induced Activity in Cyclotron Components, Targets And Vault Walls	For Use and Storage in Place or Storage for Decay On-Site Incidental to Cyclotron Operations
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*Special Nuclear Material

**Sealed sources which have been evaluated and approved for licensing purposes and authorized for use in accordance with the Sealed Sources and Devices Registry.

1. Radiopharmaceutical material shall be used, stored and distributed from:

Cardinal Health 414, LLC	AI No. 199589
Cardinal Health PET Manufacturing Services	
1405 Jefferson Highway, Suite B	
Jefferson, Louisiana 70121	

2. The licensee is authorized to manufacture/compound, possess, package and distribute licensed radioactive material.
3. The cyclotron shall be operated only by, or under the supervision of, John Daniel Glenn, Leonard Popa, Bob Chicoine, Ken Moore, Jeremy Guilbeau, Valdas Petrauskas, Nelson Paree, Greg Good, Steve Bostjancic, Scott R. Lucas, Charles Eads, Kevin Williams, Derrick Alcaide, Ruben Guebara, Dan Ewert, Misael Vega, Olof Robert Nilsson, Charles Parraga, Daniel McLaren, Alfonso Hernandez, Erica Byrd, Matthew P. Anderson, Adam Fleshner, and Jose Luis Rangel Rodriguez.
4. The Radiation Safety Officer for this license is John Daniel Glenn.
5. At least one individual listed in Condition 3 of this license shall be physically present at the authorized location of use whenever licensed material is being used.
6. Repair or maintenance of activated target cells, target cell components, activated magnetic coils, yoke, vacuum tank, or concrete shall only be performed by the individual named as authorized user in Condition 3.
7. Access to the cyclotron room shall be controlled by a door at each entrance. Such doors shall normally be closed and secured against unauthorized entry. Constant surveillance by the physical presence of a user in Condition 3 above, is adequate security against unauthorized entry.
8. The cyclotron shall be used to produce and accelerate protons only.

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIOACTIVE MATERIAL LICENSE

LICENSEE	LICENSE NUMBER	AMENDMENT NUMBER	AI NUMBER	
Cardinal Health 414, LLC	LA-13323-L01	6	199589	Page 3 of 4 Page(s)

9. Biological products labeled with radionuclides or kits used to prepare such products shall be procured from a supplier who holds an unsuspended or unrevoked license issued by the Secretary of the Department of Health and Hospitals to propagate, manufacture, prepare, label, or distribute the products.
10. A. Radiopharmaceuticals dispensed and/or distributed for human use shall be either:
 - (1) Repackaged from prepared radiopharmaceuticals that are the subject of an FDA approved New Drug Application (NDA), Abbreviated New Drug Application, (ANDA), or an Investigational New Drug Application (IND), or
 - (2) Prepared from generators and reagent kits that are subject of an FDA approved NDA, ANDA, or IND.
- B. Prepared radiopharmaceuticals for which the FDA has accepted an IND and radiopharmaceuticals prepared from generators or reagent kits for which the FDA has accepted an IND shall be dispensed and/or distributed:
 - (1) In accordance with the directories provided by the sponsor of the IND; and
 - (2) Only to physicians who have been accepted by the sponsor of the IND to participate in clinical evaluation of the drug.
11. The licensee may possess, prepare and distribute products considered experimental (FDA Phase III Clinical Trials) provided these activities are conducted under the following limitations:
 - A. The experimental products must be ordered by a physician who possesses authorization from the Department to perform procedures using these specific products. Copies of the physician's authorization must be maintained.
 - B. The manufacturer's master protocol with regard to preparation shall be rigidly adhered to.
 - C. After receipt and preparation of an experimental product, it shall be dispensed only to the physician who initiated the order. Records confirming this shall be maintained.
12. Radioactive drugs shall be dispensed under the prescription of a specifically licensed physician who is authorized to possess and use the radioactive drugs or of a physician authorized under the provisions of a radioactive material license.
13. The licensee shall obtain an updated copy of the radioactive material license of each customer, quarterly, and shall verify that the customer is authorized to receive the prescribed radiopharmaceutical prior to transferring the radiopharmaceutical.
14. Radioactive material shall not be used in or on humans until its pharmaceutical quality and assay have been established.
15. The licensee shall report in writing to the Department, within ten (10) days of occurrence, any irregularities pertaining to identification, labeling, quality or assay of any radioactive drug received under the authority of this license.

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
RADIOACTIVE MATERIAL LICENSE

LICENSEE	LICENSE NUMBER	AMENDMENT NUMBER	AI NUMBER	
Cardinal Health 414, LLC	LA-13323-L01	6	199589	Page 4 of 4 Page(s)

16. A written report of any adverse reactions resulting from the use of any radio-pharmaceutical shall be filed with the Department within five (5) days of the occurrence.
17. Radioactive material may be received, possessed, stored, transported, transferred, and used for non-human uses, by individuals specifically designated by the Radiation Safety Officer listed in Condition 4 of this license.
18. Experimental animals administered radioactive materials or their products shall not be used for human consumption.
19. Sealed sources containing radioactive material shall not be opened by the licensee.
20. The licensee shall submit an updated decommissioning funding plan to be reviewed and approved by the Department three (3) years from the date of the most recent financial assurance review which was performed in March 23, 2015.
21. The Department shall require financial assurance in accordance with LAC 33.XV.325 and LAC 33.XV.351, except that all radioactive material rather than specifically by-product material, will be considered in the financial assurance requirements.
22. The licensee is authorized to perform in-house tests for leakage and/or contamination on sealed radioactive sources and devices containing such sealed sources, and authorized to do in-house leak test analysis.
23. If, in an emergency, it becomes necessary for the licensee to evacuate the facility at which radioactive material is stored, it shall be the responsibility of the licensee to notify the Office of Environmental Compliance (225) 219-3041 prior to leaving. The licensee shall submit a detailed description of how the storage location was secured prior to leaving and the licensee's temporary address, phone number(s) or other means of being contacted. This information shall be kept updated until the licensee is able to return to the licensed storage location.
24. Except as specifically provided otherwise by the license, the licensee shall possess and use radioactive material described in all schedules of this license in accordance with LAC 33:XV and statements, representations, and procedures contained in the licensee's application (complete submission) dated November 30, 2015, and in all subsequent correspondence. The regulations in LAC 33:XV shall take precedence unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than these regulations.

LI:TW

RADIOISOTOPE HANDLING EXPERIENCE

Name: Andrew Hughes

Date: 18-Feb-2020

Document the actual use/handling of radioactive material under the supervision of an Authorized Nuclear Pharmacist.

ISOTOPE	MAXIMUM ACTIVITY HANDLED	USE See key below: 1,2,3,4,5,6,7	EXPERIENCE Actual clock hours (Include date range of experience)	WHERE EXPERIENCE GAINED
F-18	20,000 mCi	1,2,3,4,5,6	10/2007-06/2019 17,280 hours	PETNET Solutions Woburn, MA
Cs-137	1 uCi	2	10/2007-06/2019 17,280 hours	PETNET Solutions Woburn, MA
Co-57	1 uCi	2	10/2007-06/2019 17,280 hours	PETNET Solutions Woburn, MA
In-111	80 mCi	1,2,5,6	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN
Ac-225	5 mCi	1,2,5,6	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN
Eu-152	1 uCi	2	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN
Na-22	1 uCi	2	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN
H-3	1 uCi	2	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN
C-14	1 uCi	2	07/2019-Present 1000 hours	Cardinal Health Indianapolis, IN

Key for "Use": the number, or numbers, entered under "Use" should correspond to the handling experience for each isotope.

- Ordering, shipping, receiving radioactive materials and performing related radiation surveys
- Calibrating, using and performing checks for proper operation of dose calibrators, scintillation detectors, survey meters, and, if appropriate, instruments used to measure alpha- or beta-emitting radionuclides
- Calculating, assaying and safely preparing dosages for patients or human research subjects
- Using appropriate internal controls to avoid mistakes in the labeling and/or administration of by product material
- Using procedures to prevent or minimize contamination and using proper decontamination procedures
- Learning emergency procedures to handle and contain spilled materials safely, including related decontamination procedures, surveys, and wipe tests
- Eluting Tc-99m from generator systems, assaying the eluate for Tc-99m and for Mo-99 contaminations, and processing the eluate with reagent kits to prepare Tc-99m labeled radioactive drugs.



THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH
RADIATION CONTROL PROGRAM
MATERIALS LICENSE

Pursuant to Massachusetts General Laws Chapter 111, Sections 3, 5M, 5N, 5O and 5P and Massachusetts Regulations for the Control of Radiation, Section 120.100, Licensing of Radioactive Material, and in reliance on statements and representation heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer radioactive materials designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations 105 CMR 120.000. This license shall be deemed to contain the conditions specified in 105 CMR 120.000 and is subjected to all applicable rules, regulations of the Department of Public Health, Commonwealth of Massachusetts, now or hereafter in effect and to any conditions specified below.

<p style="text-align: center;">Licensee</p> <p>1. PETNET Solutions, Inc.</p> <p>2. 810 Innovation Drive Knoxville, Tennessee 37932</p>	<p>3. License Number: 41-0296 is amended in its entirety, in accordance with the letter dated January 18, 2013, to read as follows:</p> <p style="text-align: center;">Amendment No: <u>17</u></p> <p>4. Expiration Date: May 31, 2016</p> <p>5. Docket No: 08-1476</p>
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6. Radioactive Material	7. Chemical/Physical Form	8. Maximum Possession Limit
A. Any radionuclide with atomic number 3-83, excluding Zn-65	A. Fixed activated cyclotron parts and concrete	A. 1 Curie
B. Any radionuclide with atomic number 3-83	B. Removable activated cyclotron components	B. 200 millicuries
C. Hydrogen-3	C. Liquid	C. 5 millicuries
D. Carbon-11	D. Any	D. 5 Curies
E. Nitrogen-13	E. Any	E. 2 Curies
F. Fluorine-18	F. Any	F. 40 Curies
G. Cobalt-57	G. Sealed calibration check source	G. Not to exceed 10 millicuries per source; 20 millicuries total

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM MATERIALS LICENSE SUPPLEMENTARY SHEET	LICENSE NUMBER: 41-0296
	DOCKET NUMBER: 08-1476
	AMENDMENT NUMBER: <u>17</u>

H. Zinc-65	H. Fixed activated cyclotron parts and concrete	H. 300 millicuries
I. Germanium-68	I. Sealed calibration check source	I. Not to exceed 1 millicurie per source; 1 millicurie total
J. Cesium-137	J. Sealed calibration check source	J. Not to exceed 1 millicurie per source; 1 millicurie total

9. Authorized use:

- A., B. and H. Possession and storage incident to production.
- C. Recyclable target material waste product incident to production.
- D. through F. Production, possession, handling, packaging and distribution to persons authorized to receive radiochemicals pursuant to the terms and conditions of specific licenses issued by the Agency, the U.S. Nuclear Regulatory Commission or Agreement State.
- G., I. and J. Instrument calibration and instrument calibration checks.

CONDITIONS

10. Radioactive material shall be only used or stored at the licensee's facilities located at 268 West Cummings Park, Woburn, Massachusetts.
11. This license is subject to an annual fee as determined by the Executive Office for Administration and Finance.

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM MATERIALS LICENSE SUPPLEMENTARY SHEET	LICENSE NUMBER: 41-0296
	DOCKET NUMBER: 08-1476
	AMENDMENT NUMBER: <u>17</u>

12. A. Licensed material and cyclotron operation shall be used by, or under the supervision of, Nicholas Ackles, Larry Beagle, Harold Farris, Lucas Fernandez, Andrew B. Hughes, Hevelt Jacques, Bakr Ragragui, Michael Trenbeath or Tim Tuohy.

B. The Radiation Safety Officer for this license is Douglas Huzar, R.Ph.
13. Sealed sources or detector cells containing licensed material shall not be opened or sources removed from the source holder by the licensee.
14. The licensee shall conduct a physical inventory every 6 months, or at other intervals approved by the Agency, to account for all sources and/or devices received and possessed under the license. Records of inventories shall include the radionuclides, quantities, manufacturer's name and model numbers, and the date of inventory.
15. A. Sealed sources shall be tested for leakage and/or contamination at intervals not to exceed six (6) months or at such other intervals as are specified by the certificate of registration referred to in 105 CMR 120.128(N). In the absence of a certificate from a transferor indicating that a leak test has been made within six (6) months prior to the transfer, a sealed source received from another person shall not be put into use until tested.

B. Sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person, and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

C. The leak test shall be capable of detecting the presence of 185 becquerel (0.005 microcurie) of radioactive material on the test sample. Records of leak test results shall be kept in units of becquerel or microcurie and shall be maintained for inspection by the Agency. If the test reveals the presence of 185 becquerel (0.005 microcurie) or more of removable contamination, a report shall be filed with the Agency and the source shall be removed from service and decontaminated, repaired, or disposed of in accordance with Agency regulations. The report shall be filed within 5 days of the date the leak test result is known with the Massachusetts Department of Public Health, ATTN: Director, Radiation Control Program. The report shall specify the source involved, the test results, and the corrective action taken.

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM MATERIALS LICENSE SUPPLEMENTARY SHEET	LICENSE NUMBER: 41-0296
	DOCKET NUMBER: 08-1476
	AMENDMENT NUMBER: <u>17</u>

- D. The licensee is authorized to collect leak test samples for analysis. Alternatively, tests for leakage and/or contamination may be performed by persons specifically licensed by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State to perform such services.
16. The licensee shall not acquire licensed material in a sealed source or in a device that contains a sealed source unless the source or device has been registered pursuant to 105 CMR 120.128(N), or equivalent regulations of the U.S. Nuclear Regulatory Commission or an Agreement State. The licensee may possess and use sealed sources which were in the licensee's possession as of the date of this license.
17. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 105 CMR 120.125(C) for establishing financial assurance for decommissioning.
18. In addition to the possession limits in Item 8, the licensee shall further restrict the possession of licensed material to quantities below the minimum limit specified in 105 CMR 120.146 for establishing an emergency plan for responding to a release of licensed material.
19. The licensee is authorized to hold radioactive material with a half-life of less than 120 days for decay-in-storage before disposal in ordinary trash, provided:
- A. Before disposal as ordinary trash, the waste shall be surveyed at the container surface with the appropriate survey instrument set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
- B. A record of each such disposal permitted under this License Condition shall be retained for three (3) years. The record must include the date of disposal, the date on which the radioactive material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
20. The licensee shall only transport radioactive material or deliver radioactive material to a carrier for transport in accordance with the provisions of 49 CFR Parts 170 through 189, 10 CFR Part 71, and 105 CMR 120.770 "Transportation of Radioactive Material."

COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH RADIATION CONTROL PROGRAM MATERIALS LICENSE SUPPLEMENTARY SHEET	LICENSE NUMBER: 41-0296
	DOCKET NUMBER: 08-1476
	AMENDMENT NUMBER: <u>17</u>

21. Except as specifically provided otherwise by this license, the licensee shall conduct its program in accordance with statements, representations and procedures contained in the documents, including any enclosures, listed below. The Massachusetts Regulations for the Control of Radiation (105 CMR 120.000) shall govern, unless statements, representations and procedures in the licensee's application and correspondence are more restrictive than the regulations.

- A. Renewal application dated April 28, 2010
- B. Electronic letter dated December 1, 2010
- C. Letter dated February 28, 2012
- D. Letter dated January 18, 2013

FOR THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH
RADIATION CONTROL PROGRAM

Date: 3-22-2013

By: Beverly E. Anderson
Beverly E. Anderson, MPH, RS, Interim Director



East Tennessee State University

Johnson City, Tennessee

*The Tennessee Board of Regents for the State University
and Community College System of Tennessee upon the recommendation
of the Faculty has conferred on*

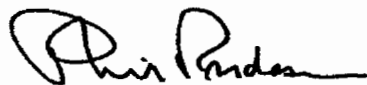
Andrew B. Hughes

the degree of

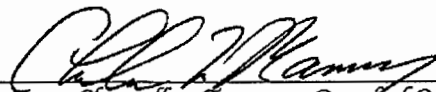
Bachelor of Science

with all the rights, privileges and honors thereunto appertaining.


*The Tennessee Board of Regents has issued this diploma on the
nineteenth day of December, two thousand nine.*



Governor
Chairman, Tennessee Board of Regents



Chancellor, Tennessee Board of Regents



President of the University



University of Massachusetts

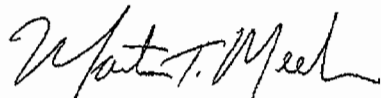


*The Board of Trustees in accordance with the recommendations
of the President of the University and of the Chancellor
and Faculty of the University of Massachusetts Lowell,
hereby confers upon*

Andrew Brooks Hughes

the Degree of
Master of Science
Clinical Laboratory Sciences

*in consideration of the satisfactory completion of the Course of Study
prescribed for that Degree. Given at Lowell* **February 1, 2014**


CHANCELLOR, LOWELL CAMPUS


PRESIDENT OF THE UNIVERSITY


CHAIRPERSON, BOARD OF TRUSTEES

ORIGIN ID:OSUA (614) 757-5074
 DAN HILL
 CARDINAL HEALTH
 7000 CARDINAL PLACE

DUBLIN, OH 43017
 UNITED STATES US

SHIP DATE: 21FEB20
 ACTWGT: 1.00 LB
 CAD: 104744132/INET4220

BILL SENDER

TO **NMSS LICENSING / BRYAN PARKER**
US NRC REGION III
2443 WARRENVILLE ROAD
SUITE 210
LISLE IL 60532

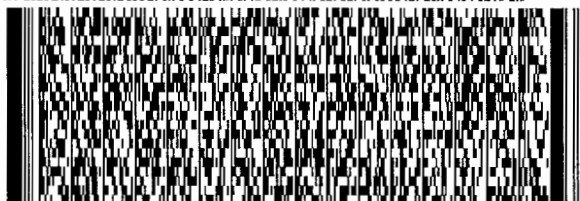
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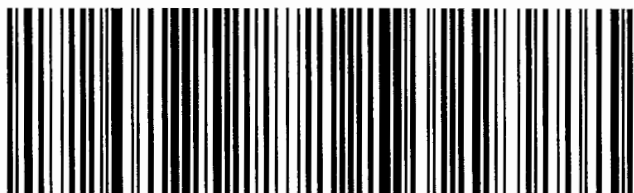
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