

510(k) SUMMARY OF SAFETY AND EFFECTIVENESS**General Information**

- A. **Submitter/ Contact Person:**
 Philips Medical Systems (Cleveland), Inc. Rae Ann Farrow
 595 Miner Rd. Tel: (440) 483-2647
 Cleveland, OH 44143 Fax: (440) 483-7339
- B. **Device Trade Name:** Gemini
Common Name: Positron Emission Tomography
 Computed Tomography X-Ray
Classification Name: System, Emission Computed Tomography, (892.1200)
 System, Computed Tomography X-Ray, (892.1750)
Device Class: 21CFR 892.1200, Class II
 21 CFR 892.1750, Class II
Product Code: 90 KPS and 90 JAK
- C. **Date prepared:** June 18, 2004
- D. **Predicate Device:** Gemini 16 (K032036)
 Mx8000 IDT CT System (K012009)
 Allegro Imaging System (K033782)
 Discovery LS System (K040172)
- E. **Performance Standards:**
- 21 CFR 1020.30 - 1020.33 Performance Standards for Ionizing Radiation Emitting Products, Computed Tomography Equipment (Applicable Sections)
 - NEMA NU-2
- F. **Intended Use:**

The device is a diagnostic imaging system for fixed or mobile installations that combines Positron Emission Tomography (PET) and X-ray Computed Tomography (CT) systems. The CT subsystem produces cross-sectional images of the body by computer reconstruction of x-ray transmission data. The PET subsystem produces images of the distribution of PET radiopharmaceuticals in the patient body (specific radiopharmaceuticals are used for whole body, head, heart and other organ imaging). Attenuation correction is accomplished by either CTAC or Cs-137. The device also provides for list mode, dynamic, and gated acquisitions.

Image processing and display workstations provide software applications to process, analyze, display, quantify and interpret medical images/data. The PET and CT images may be registered and displayed in a "fused" (overlaid in the same spatial orientation) format to provide combined metabolic and anatomical data at different angles. Trained professionals use the images in:

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- The evaluation, detection and diagnosis of lesions, disease and organ function such as but not limited to cancer, cardiovascular disease, and neurological disorders.
 - The detection, localization, and staging of tumors and diagnosing cancer patients.
 - Treatment planning and interventional radiology procedures.

Cardiac imaging software provides functionality for the quantification of cardiology images and datasets including but not limited to myocardial perfusion for the display of wall motion and quantification of left-ventricular function parameters from gated myocardial perfusion studies and for the 3D alignment of coronary artery images from CT coronary angiography onto the myocardium.

Both subsystems (PET and CT) can also be operated independently as fully functional, diagnostic imaging systems including application of the CT scanner as a radiation therapy simulation scanner.

G. *Device Description/ Comparison with Predicate Device:*

The device is a hybrid diagnostic imaging system that combines Positron Emission Tomography (PET) and X-ray Computed Tomography (CT) scanners that can be utilized in fixed installations or mobile environments. The device is comprised of the following system components/subsystems: Positron Emission Tomography (PET), X-ray Computed Tomography (CT), a patient table, gantry separation unit, and the acquisition and processing workstations. The 16-slice configuration is also referred to as Gemini 16 Power.

H. *System Performance Test/ Summary of Studies:*

To minimize electrical, mechanical and radiation hazards, Philips Medical System adheres to recognized and established industry practice. Radiation safety is assured by compliance and certification to the performance standards for ionizing radiation emitting product, 21CFR 1020.30 and 21CFR 1020.33. The radiation safety product report will be filed in accordance with 21CFR 1002.10 with the Center for Device and Radiological Health. Electrical and mechanical safety is assured by adherence and certification to the applicable standards in the IEC 60601-1 series. The device performance was measured in accordance with the NEMA-NU2 standard.

I. *Comparison to Predicate Devices:*

The device is a modification of the currently marketed Gemini 16 PET/CT System (K032036). Design modifications include the addition of third party cardiac display and analysis software, enhancements to DICOM workflow and Syntegra. The similarities and differences between the Gemini and the predicate devices are described in detail in Section VI of the premarket notification.

In conclusion, the device is substantially equivalent to the predicate devices based upon similar intended use, technological comparison, and system performance.



JUL 29 2004

Food and Drug Administration
9200 Corporate Boulevard
Rockville MD 20850

Philips Medical Systems (Cleveland), Inc. Re: K041955

% Mr. Morten Simon Christensen
ReviewerUnderwriters Laboratories, Inc
1655 Scott Boulevard
SANTA CLARA CA 95050-4169Trade/Device Name: Gemini PET/CT
Imaging System

Regulation Number: 21 CFR 892.1200

Regulation Name: Emission computed
tomography system

Regulation Number: 21 CFR 892.1750

Regulation Name: Computed tomography
x-ray system

Regulatory Class: II

Product Code: 90 KPS and JAK

Dated: July 19, 2004

Received: July 21, 2004

Dear Mr. Christensen:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

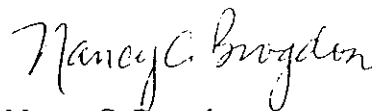
This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Office of Compliance at one of the following numbers, based on the regulation number at the top of the letter:

8xx.1xxx	(301) 594-4591
876.2xxx, 3xxx, 4xxx, 5xxx	(301) 594-4616
884.2xxx, 3xxx, 4xxx, 5xxx, 6xxx	(301) 594-4616
892.2xxx, 3xxx, 4xxx, 5xxx	(301) 594-4654
Other	(301) 594-4692

Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97) you may obtain. Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its Internet address <http://www.fda.gov/cdrh/dsma/dsmamain.html>.

Sincerely yours,



Nancy C. Brogdon
Director, Division of Reproductive,
Abdominal and Radiological Devices
Office of Device Evaluation
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number (if known): ~~Not Known~~ K041955

Device Name: Gemini

Indications for Use:

The device is a diagnostic imaging system for fixed or mobile installations that combines Positron Emission Tomography (PET) and X-ray Computed Tomography (CT) systems. The CT subsystem produces cross-sectional images of the body by computer reconstruction of x-ray transmission data. The PET subsystem produces images of the distribution of PET radiopharmaceuticals in the patient body (specific radiopharmaceuticals are used for whole body, head, heart and other organ imaging). Attenuation correction is accomplished by either CTAC or Cs-137. The device also provides for list mode, dynamic, and gated acquisitions.

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Prescription Use
(Part 21 CFR 801 Subpart D)

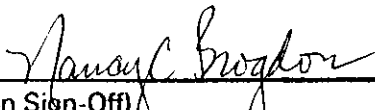
AND/OR

Over-The-Counter Use _____
(21 CFR 801 Subpart C)

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Concurrence of CDRH, Office of Device Evaluation (ODE)

Page ___ of ___



(Division Sign-Off)
Division of Reproductive, Abdominal,
and Radiological Devices
510(k) Number K041955