Summary of Safety and Effectiveness Data

I. GENERAL INFORMATION

Product Generic Name:	Drug-Eluting Coronary Stent System (NIQ)
Product Trade Name:	TAXUS® Liberté® Long Paclitaxel-Eluting Coronary Stent System (Monorail and Over-the-Wire) 2.75 – 4.00 mm x 38 mm
Applicant's Name and Address:	Boston Scientific Corporation One Scimed Place Maple Gove, MN 55311-1566 USA
Premarket Approval Application (PMA) Number:	P060008/S011
Date of Panel:	Not Applicable
Date of Notice of Approval to Applicant:	July 13, 2009

The original PMA (P060008) was approved on October 10, 2008 and is indicated for improving luminal diameter for the treatment of de novo lesions ≤ 28 mm in length in native coronary arteries ≥ 2.50 to ≤ 4.00 mm in diameter. The SSED to support the indication is available on the CDRH website and is incorporated by reference here: http://www.accessdata.fda.gov/cdrh_docs/pdf6/P060008a.pdf. This PMA supplement, P060008/S011, was submitted to support expansion of the indications of the product, specifically, for improving luminal diameter for the treatment of de novo lesions ≤ 34 mm in length.

II. INDICATIONS FOR USE

The TAXUS Liberté Paclitaxel-Eluting Coronary Stent System (Monorail and Over-the-Wire Systems) is indicated for improving luminal diameter for the treatment of de novo lesions in native coronary arteries ≥ 2.75 to ≤ 4.00 mm in diameter in lesions ≤ 34 mm in length.

III. CONTRAINDICATIONS

Use of the TAXUS Liberté Paclitaxel-Eluting Coronary Stent System is contraindicated in patients with:

- Known hypersensitivity to 316L stainless steel.
- Known hypersensitivity to paclitaxel or structurally-related compounds.
- Known hypersensitivity to the polymer or its individual components.

Coronary Artery Stenting is contraindicated for use in:

- Patients who cannot receive recommended anti-platelet and/or anticoagulant therapy.
- Patients judged to have a lesion that prevents complete inflation of an angioplasty balloon or proper placement of the stent or delivery device.

IV. WARNING AND PRECAUTIONS

The warnings and precautions can be found in the TAXUS Liberté Paclitaxel-Eluting Coronary Stent System Directions for Use (DFU).

V. DEVICE DESCRIPTION

The TAXUS Liberté Paclitaxel-Eluting Coronary Stent System is a device / drug combination product comprised of two regulated components: a device (Liberté Coronary Stent System) and a drug product (a formulation of paclitaxel contained in a polymer coating). The components and characteristics of the TAXUS Liberté Long Paclitaxel-Eluting Coronary Stent System are identical to the workhorse and large vessel models of the TAXUS Liberté Paclitaxel-Eluting Coronary Stent System approved in P060008. Please refer to the device description provided in the original SSED for additional details. The characteristics of the TAXUS Liberté Long stent system are described in **Table 1**.

Table 1: TAXUS Liberté Long Stent System Product Description

	TAXUS Liberté Long Monorail® Stent Delivery System	TAXUS Liberté Long Over-the-Wire Stent Delivery System
Available Stent Lengths (mm)	38	
Available Stent Diameters (mm)	2.75, 3.00, 3.50, 4.00	
Stent Material	A 316L surgical grade stainless steel Liberté® stent	
Drug Product	A conformal coating of a polymer carrier loaded with 1μg/mm^2 paclitaxel in a slow release (SR)* formulation applied to the stent with a maximum nominal drug content of 273 μg on the largest stent (4.00 x 38 mm).	
Delivery System		
Working Length	140 cm	135 cm
Delivery System Y-Adapter Ports	Single access port to inflation lumen. Guidewire exit port is located approximately 25 cm from tip. Designed for guidewire ≤ 0.014 in	Y-Connector (Side arm for access to balloon inflation/deflation lumen. Straight arm is continuous with shaft inner lumen). Designed for guidewire ≤ 0.014 in
Stent Delivery	A balloon, nominally 0.4 mm longer than the stent, with two radiopaque markers.	
Balloon Inflation Pressure	Nominal Inflation Pressure: 8 ATM Rated Burst Inflation Pressure: 18 ATM	
Guide Catheter Inner Diameter	≥ 0.058 in	≥ 0.066 in
Catheter Shaft Outer Diameter	1.8F proximally and 2.7F distally (2.75 – 3.00 mm) 2.0F proximally and 2.7F distally (3.50 – 4.00 mm)	3.2F proximally, 2.7F distally

*Release rate is a function of weight/weight ratio of polymer and drug, and (SR) is the formulation that was studied clinically and is used in the marketed product.

VI. ALTERNATIVE PRACTICES OR PROCEDURES

Treatment of patients with coronary artery disease may include exercise, diet, drug therapy, percutaneous coronary interventions (such as angioplasty, and placement of bare metal stents, coated stents, and other drug eluting stents), and coronary artery bypass surgery (CABG).

VII. MARKETING HISTORY

The TAXUS Liberté Paclitaxel-Eluting Coronary Stent System 38 mm size is commercially available in the following countries:

- Albania
- Algeria
- Antigua/Barbuda
- Argentina
- Armenia
- Aruba
- Australia
- Austria
- Bahamas
- Bahrain
- Bangladesh
- Barbados
- Belarus
- Belgium
- Belize
- Bermuda
- Bolivia
- Bosnia
- Brazil
- Brunei
- Bulgaria
- Chile
- Colombia
- Costa Rica
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Djibouti
- Dominican Rep
- Dutch Antilles
- Ecuador
- Egypt
- El Salvador
- Estonia
- Finland
- France
- Georgia
- Germany
- Great Britain
- Greece
- Guatemala
- Guyana
- Haiti
- Honduras
- Hong Kong
- Hungary
- Iceland
- India
- Iran
- Iraq
- Ireland
- Israel
- Italy
- Jamaica
- Jordan
- Kenya
- Korea
- Kuwait
- Latvia
- Lebanon
- Libya
- Liechtenstein
- Lithuania
- Luxembourg
- Macau
- Macedonia
- Malaysia
- Malta
- Martinique
- Mauritania
- Mauritius
- Mexico
- Moldavia
- Morocco
- Myanmar
- Nepal
- Netherlands
- New Zealand
- Nicaragua
- Norway
- Oman
- Pakistan
- Panama
- Paraguay
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Saudi Arabia
- Serbia/Montenegro
- Singapore
- Slovakia
- Slovenia
- South Africa
- Spain
- Sri Lanka
- Sudan
- Suriname
- Sweden
- Switzerland
- Syria
- Thailand
- Trinidad/Tobago
- Tunisia
- Turkey
- United Arab Emirates
- Ukraine
- Uruguay
- Venezuela
- Vietnam
- West Bank Gaza Strip
- Yemen

As of May 2009, over 18,000 TAXUS Liberté 38 mm stents have been distributed outside the U.S. No products have been withdrawn from the market in any country for any reason.

VIII. Potential Adverse Events

Potential adverse events (in alphabetical order) which may be associated with the use of a coronary stent in native coronary arteries include but are not limited to:

- Abrupt stent closure
- Acute myocardial infarction
- Allergic reaction to anti-coagulant and/or antiplatelet therapy, contrast medium, or stent materials
- Angina
- Arrhythmias, including ventricular fibrillation (VF) and ventricular tachycardia (VT)
- Arteriovenous fistula
- Cardiac tamponade
- Cardiogenic shock/Pulmonary edema
- Coronary aneurysm
- Death
- Dissection
- Emboli, distal (air, tissue or thrombotic material or material from devices(s) used in the procedure)
- Heart failure
- Hematoma
- Hemorrhage, required transfusion
- Hypotension/Hypertension
- Infection, local or systemic
- Ischemia, myocardial
- Pain, at the access site
- Perforation or Rupture of coronary artery
- Pericardial effusion
- Pseudoaneurysm, femoral
- Renal Failure
- Respiratory Failure
- Restenosis of stented segment
- Stent emobolization or migration
- Stent thrombosis/occlusion
- Stroke/cerebrovascular accident /TIA
- Total occlusion of coronary artery
- Vessel spasm
- Vessel trauma requiring surgical repair or reintervention

Potential adverse events not captured above, that may be unique to the paclitaxel drug coating:

- Allergic/immunologic reaction to drug (paclitaxel or structurally-related compounds) or the polymer stent coating (or its individual components)
- Alopecia
- Anemia
- Blood product transfusion
- Gastrointestinal symptoms
- Hematologic dyscrasia (including leukopenia, neutropenia, thrombocytopenia)
- Hepatic enzyme changes
- Histologic changes in vessel wall, including inflammation, cellular damage or necrosis
- Myalgia/Arthralgia
- Peripheral neuropathy

For the specific events that occurred in the clinical study, please see Section X.

IX. SUMMARY OF PRECLINICAL STUDIES

A series of non-clinical laboratory studies were performed – those related to the stent and the stent delivery system [i.e. the stent on either the Monorail (MR) or Over-The-Wire (OTW) stent delivery system (SDS)], the polymer substance [i.e., poly(styrene-b-isobutylene-b-styrene) (SIBS)], the drug substance (i.e., paclitaxel) and the finished combination product (i.e., TAXUS Liberté Paclitaxel-Eluting Coronary Stent).

A. Biocompatibility Studies

The biocompatibility testing information included in the original PMA submission (P060008, approved October 10, 2008) is directly applicable to this PMA supplement. Please refer to the original SSED for details regarding the biocompatibility studies.

B. *In Vivo* Pharmacokinetics

The non-clinical chemistry information included in the original PMA submission (P060008, approved October 10, 2008) are directly applicable to this PMA Supplement; therefore, the information is not repeated herein.

C. *In Vitro* Engineering Testing

The in vitro engineering testing included in the original PMA submission (P060008, approved October 10, 2008) is directly applicable to this PMA Supplement. Therefore, only the testing information specific to the 38 mm length stent are summarized below in **Table 2**. "Pass" denotes that the test results met product specifications and/or the recommendation in relevant FDA guidance documents.

Table 2: Stent and Delivery Catheter Engineering Testing

Test	Description of Test	Conclusion
Stent Dimensional and Functional Attributes		
Dimensional Verification	Testing was conducted to measure and optically inspect the stent to document that stent dimensional measurements do not deviate from product specifications. All products met specifications.	Pass
Foreshortening	The length of the stents were measured prior to and after expansion to the largest nominal diameter. All stents met product specifications.	Pass
Stent Delivery System Dimensional and Functional Attributes		
Delivery, Deployment and Retraction	The delivery, deployment and retraction of the TAXUS Liberté Stent System was assessed by testing system track and guidewire movement at rated burst pressure. Testing demonstrated that the TAXUS Liberté stent system could be delivered to the target location, deployed, and retracted, thus met required product specifications.	Pass
Balloon Fatigue	TAXUS Liberté stent systems across the range of stent/balloon lengths and diameters were required to complete 10 pressurization cycles to Rated Burst Pressure (RBP). The results show statistically that, with 95% confidence, 90% of the catheters will not experience balloon, shaft, or proximal/distal seal loss of integrity at or below the maximum recommended rated balloon burst pressure.	Pass
Balloon Inflation and Deflation Time	TAXUS Liberté delivery systems across the range of balloon lengths and diameters were tested for inflation/deflation times, and all stent systems met specifications.	Pass
Stent Securement for Unsheathed Stents	Testing was conducted to assess the forces required to displace a crimped TAXUS Liberté stent from the delivery systems (1) after tracking through a simulated tortuous artery model and then through a simulated lesion and (2) during non-coaxial withdrawal. All stent systems met specification.	Pass
Balloon Catheter Withdrawal Resistance	TAXUS Liberté is to have statistically lower withdrawal forces as compared to TAXUS Express[2] when analyzed as a pooled population with 95% confidence.	Pass
Stent, System and Coating Durability Testing		
Coating Durability	The coating durability of the TAXUS Liberté stent coating was assessed pre-expansion and post deployment beyond rated burst pressure. The test results demonstrate that the paclitaxel/SIBS coating displays good durability and coating integrity that will be maintained throughout the lifetime of the coated stent implant.	Pass

D. Coating Characterization Testing

The coating characterization information included in the original PMA submission (P060008, approved October 10, 2008) is directly applicable to this PMA supplement. Therefore, only the testing information specific to the 38 mm length stent is summarized below in **Table 3**.

Table 3: Coating Characterization Testing

Test	Description of Test
Material Characterization	
Particulates	Particulate levels were evaluated for the TAXUS Liberté stent system post deployment, over-expansion and simulated use.

E. Chemistry Manufacturing and Controls (CMC) Testing

The CMC information included in the original PMA submission (P060008, approved October 10, 2008) is directly applicable to this PMA Supplement; therefore, the information is not repeated herein.

F. Stability

Stability studies were conducted to establish a shelf life/expiration date for the TAXUS Liberté Long Paclitaxel-Eluting Coronary Stent System. Based on these studies, a shelf life of 18 months is appropriate.

G. Sterilization

The TAXUS Liberté Paclitaxel-Eluting Coronary Stent System (Monorail and Over-The-Wire) is sterilized using ethylene oxide sterilization and has been validated per AAMI/ISO 1135:1994 "Medical Devices – Validation and Routine Control of Ethylene Oxide Sterilization."

Results obtained from the sterilization studies show that the product satisfies a minimum Sterility Assurance Level (SAL) of 10^{-6}.

The amount of bacterial endotoxin was verified to be within the specification limit for TAXUS Liberté Long Paclitaxel-Eluting Coronary Stent System.

H. Animal Studies

The non-clinical studies included in the original PMA submission (P060008, approved October 10, 2008) are directly applicable to this PMA Supplement; therefore, the information is not repeated herein.

X. SUMMARY OF PRIMARY CLINICAL STUDIES

TAXUS ATLAS Long Lesion Trial

The applicant performed a clinical study to establish a reasonable assurance of safety and effectiveness of coronary drug-eluting stent implantation with the 38 mm TAXUS Liberté Coronary Stent System for improving luminal diameter for the treatment of de novo lesions in native coronary arteries 26 mm to 34 mm in length with reference vessel diameter from 2.7 mm to 4.0 mm in the US under IDE #G040100. Data from this clinical study were the basis for the PMA approval decision. A summary of the clinical study is presented below.

Study Design

The TAXUS ATLAS Long Lesion (LL) trial was a prospective, multicenter, single-arm, trial to evaluate the safety and efficacy of the TAXUS Liberté 38 mm stent in the treatment of long (26 – 34 mm) *de novo* coronary artery lesions. The outcomes of TAXUS ATLAS LL study were compared to a historical control derived from the TAXUS IV and TAXUS V *de novo* clinical trials. TAXUS ATLAS LL was tested for non-inferiority versus a lesion matched cohort of patients receiving the TAXUS Express stent in TAXUS IV and TAXUS V *de novo* trials.

The primary endpoint of the study was percent diameter stenosis (%DS) of the analysis segment at 9 month follow-up as determined by QCA. Patients were enrolled after successful predilation and received a TAXUS Liberté paclitaxel-eluting stent with a length of 38 mm. All patients were to have angiographic follow-up at 9 months. A cohort of 50 patients was randomized upon enrollment to have IVUS performed at baseline and at 9 months. A total of 150 patients were enrolled in TAXUS ATLAS SV study from 24 centers in 3 countries (New Zealand, Singapore, and the United States).

Patients were consented, and were to be followed-up at 1, 4, and 9 months post-index procedure and 1, 2, 3, 4, and 5 years thereafter. The primary endpoint was reached after all enrolled patients had completed the 9 month follow-up.

Patients were to receive aspirin and clopidogrel or ticlopidine pre-procedure. Following the procedure patients were prescribed to mandatory clopidogrel (or ticlopidine) use for 6 months. In addition, patients were prescribed mandatory aspirin use for 9 months, with indefinite use of aspirin highly recommended.

The trial utilized a clinical event committee (CEC) to adjudicate potential Major Adverse Clinical Events (MACE), including all reported deaths and stent thromboses. During the course of the trial, a data monitoring committee (DMC) reviewed aggregate safety data to monitor for incidence of MACE and other trends that may have warranted modification of the trial. Core labs were used for central assessment of angiography and IVUS.

1. Clinical Inclusion and Exclusion Criteria
Enrollment in the TAXUS ATLAS Long Lesion study was limited to patients who met the following inclusion criteria:

1. Patient is ≥18 years old
2. Eligible for percutaneous coronary intervention (PCI)
3. Documented stable angina pectoris (Canadian Cardiovascular Society [CCS] Classification 1, 2, 3, or 4) or unstable angina pectoris with documented ischemia (Braunwald Class IB-C, IIB-C, or IIIB-C), or documented silent ischemia
4. Left ventricular ejection fraction (LVEF) of ≥ 25%
5. Acceptable candidate for coronary artery bypass grafting (CABG)
6. Patient or legal guardian understands the study requirements and the treatment procedures and provides written Informed Consent before any study-specific tests or procedures are performed
7. Willing to comply with all specified follow-up evaluations

Patients were not permitted to enroll in the TAXUS ATLAS Long Lesion study if they met any of the following exclusion criteria:

1. Known sensitivity to paclitaxel
2. Any previous, concurrent or planned treatment with a non-study anti-restenotic drug-coated or DES
3. Planned use of both the study stent and a non-study stent, (i.e., commercial stent) in the treatment of the target vessel
4. Previous or planned treatment with intravascular brachytherapy in the target vessel
5. Planned CABG ≤ 9-months post-index procedure
6. Myocardial Infarction (MI) within 72 hours prior to the index procedure and/or creatine kinase (CK) >2x the local laboratory's ULN (refers to a measured value twice the upper limits of normal on the day of the index procedure) unless CK-MB is <2x ULN. A CK-MB laboratory result must be available on the day of the procedure prior to treatment for patients with recent MI (72 hours to 30 days) or unstable angina if the CK is 2x ULN. Patients with stable angina may be enrolled without lab results being received; however, baseline CK must be drawn immediately pre-procedure.
7. Cerebrovascular Accident (CVA) within the past 6 months
8. Cardiogenic Shock characterized by systolic pressure <80 mm Hg and/or central filling pressure >20 mm Hg, or cardiac index <1.8 liters/minute/m^2 or intra-aortic balloon pump or intravenous inotropes were needed to

maintain a systolic pressure >80 mm Hg and a cardiac index >1.8 liters/minute/m^2

9. Acute or chronic renal dysfunction (creatinine >2.0 mg/dL or 177 μmol/L)
10. Contraindication to acetylsalicylic acid (ASA), or to both clopidogrel and ticlopidine
11. Leukopenia (leukocyte count <3.5 x 10^9/liter)
12. Thrombocytopenia (platelet count <100,000/mm^3) or thrombocytosis (>750,000/mm^3)
13. Active peptic ulcer or active gastrointestinal (GI) bleeding
14. Known allergy to stainless steel
15. Any prior true anaphylactic reaction to contrast agents; defined as known anaphylactoid or other non-anaphylactic allergic reactions to contrast agents that cannot be adequately pre-medicated prior to the index procedure
16. Patient was currently, or had been treated with paclitaxel or other chemotherapeutic agents within 12-months of the index procedure
17. Anticipated treatment with paclitaxel or oral rapamycin during any period in the 9-months after the index procedure
18. Male or female with known intention to procreate within 3 months after the index procedure
19. Female of childbearing potential with a positive pregnancy test within 7 days before the index procedure, or lactating
20. Life expectancy of less than 24 months due to other medical conditions
21. Co-morbid condition(s) that could limit the patient's ability to participate in the study, compliance with follow-up requirements or impact the scientific integrity of the study
22. Currently participating in another investigational drug or device study that has not completed the primary endpoint or that clinically interferes with the endpoints of this study

2. Follow-up Schedule

Follow-up included clinical assessments at 1, 4 and 9 months. All patients were to undergo angiographic follow-up at 9 months, with a randomized cohort of 50 patients who also were to undergo IVUS. In addition, patients agreed to annual telephone follow-up for clinical parameters through 5 years post-procedure.

3. Clinical Endpoints

The primary endpoint for the study was the percent diameter stenosis (%DS) of the analysis segment at 9 months, as determined by QCA. Secondary endpoints included clinical procedural and technical success, utilization parameters, MACE rates at each follow-up time point, stent thrombosis rate, target vessel failure, target vessel revascularization, QCA measurements (binary restenosis, in-stent %DS, minimum lumen diameter (MLD) and late loss), and intravascular ultrasound (IVUS) measurements (percent net volume obstruction, incomplete apposition, stent areas and volume, vessel areas and volume, lumen areas and volume, neointimal area volume).

A. Accountability of PMA Cohort

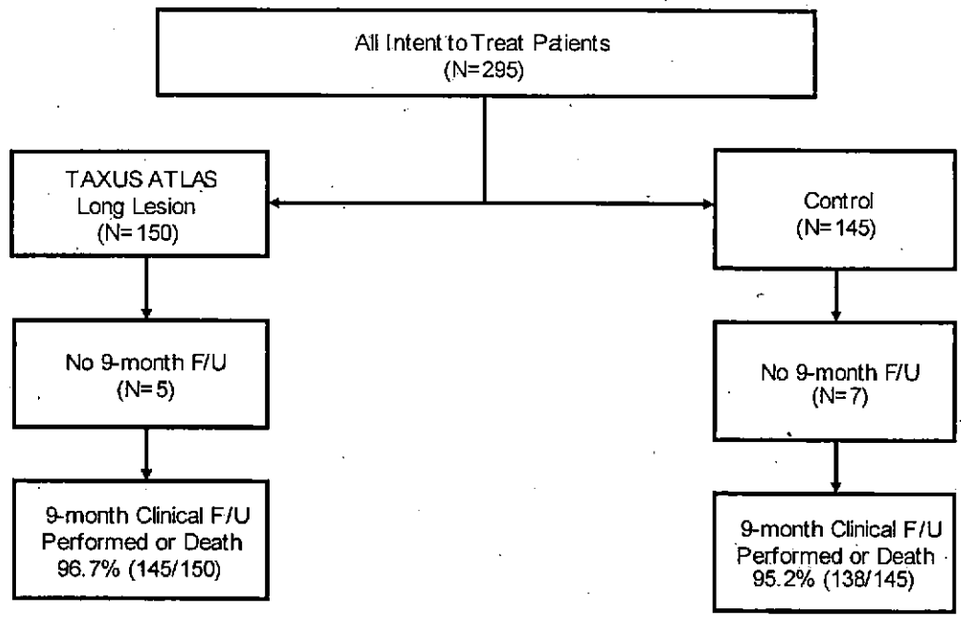


Figure 1: TAXUS ATLAS Long Lesion Group versus Control

B. Study Population Demographics and Baseline Parameters

Baseline demographic and lesion characteristics were mostly comparable between the 2 groups; however, lesion length by visual estimation was statistically significantly longer for the TAXUS ATLAS Long Lesion Group (30.44± 2.66 mm) as compared with the Control Group (28.19±1.79 mm, $P<0.0001$)

Most of the baseline angiographic lesion characteristics assessed by the CoreLab were comparable between the 2 groups. However, QCA confirmed the fact that patients in the TAXUS ATLAS Long Lesion group had lesions that were statistically significantly longer (28.08±8.31 mm, versus 21.64±7.28 mm, respectively, $P<0.0001$), had a greater degree of bend (40.21±25.51° versus 32.19 ±20.99°, respectively, $P=0.0037$), and calcification was reported more often (48.0% versus 29.6%, respectively, $P=0.0013$) than those observed in the Control group. Patients in the TAXUS ATLAS Long Lesion group also had a significantly greater proportion of more complex ACC/AHA Category C lesions (83.3% versus 65.5%, respectively, $P=0.0005$). The maximum diameter of stent implanted was similar for the groups, mean total length of study stents implanted was statistically significantly greater in the TAXUS ATLAS Long Lesion Group (40.12±5.59 mm) versus the Control Group (37.08±7.12 mm, $P<0.0001$). Total stent length to lesion length ratio was statistically significantly lower in the TAXUS ATLAS Long Lesion Group (1.57±0.61, versus 1.94±0.86 in the Control Group, $P<0.0001$, for patients with study stents only). Finally, there was statistically significantly greater procedural success (patient-based) for the TAXUS ATLAS Long Lesion Group (100%) as compared with the Control Group (96.3%, $P=0.0431$). Notably, differences in baseline characteristics were not expected to affect the primary endpoint due to propensity-score adjustment.

C. Safety and Effectiveness Results

Major Adverse Cardiac Events (MACE) reported in the TAXUS ATLAS Long Lesion Study are presented in **Table 4** below. Please note that this study was not powered to assess clinical outcomes; however, the following safety outcomes were observed:

- Cardiac Death or MI rates were numerically lower between the two groups at 9 months (1.3% in the TAXUS ATLAS Long Lesion Group versus 8.5% in the Control group).
- Total MI (both Q-wave and Non-Q-wave) rates were numerically lower between the two groups at 9-months (1.3% in the TAXUS ATLAS Long Lesion group versus 6.3% in the Control group).
- Stent thrombosis events were comparable between the two groups at 9 months (0.0% in the TAXUS ATLAS Long Lesion group versus 0.7% in the Control group).

Table 4: TAXUS ATLAS Long Lesion Major Adverse Cardiac Events (MACE) From Post-Procedure to Latest Follow-Up

	TAXUS ATLAS Long Lesion (LL) 38 mm to 1 Year	
	TAXUS ATLAS TAXUS Liberté Long 38 mm (N=150)	TAXUS Express Control (N=145)
In-Hospital MACE	0.0% (0/150)	4.1% (6/145)
30-Day MACE, overall	0.0% (0/150)	4.9% (7/143)
9-Month MACE, overall	9.4% (14/149)	14.8% (21/142)
Cardiac Death	0.0% (0/149)	2.8% (4/142)
MI	1.3% (2/149)	6.3% (9/142)
Q-Wave MI	0.0% (0/149)	1.4% (2/142)
Non-Q-Wave MI	1.3% (2/149)	4.9% (7/142)
TVR, Overall	8.7% (13/149)	8.5% (12/142)
TLR, Overall	6.0% (9/149)	7.0% (10/142)
Non-TLR, Overall	3.4% (5/149)	1.4% (2/142)
1-Year MACE	10.9% (16/147)	16.5% (23/139)
Cardiac Death	0.0% (0/147)	3.6% (5/139)
MI	1.4% (2/147)	6.5% (9/139)
Q-Wave MI	0.0% (0/147)	1.4% (2/139)
Non-Q-Wave MI	1.4% (2/147)	5.0% (7/139)
TVR, Overall	10.2% (15/147)	10.1% (14/139)
TLR, Overall	7.5% (11/147)	8.6% (12/139)
Non-TLR, Overall	3.4% (5/147)	1.4% (2/139)
1-Year Stent Thrombosis	0.0% (0/146)	0.7% (1/135)

The pre-specified primary endpoint of non-inferiority of in-segment %DS in the 38 mm TAXUS Liberté stent versus the TAXUS Express stent was met. At 9 month follow up, the propensity score adjusted difference in the in-segment %DS between the TAXUS ATLAS Long lesion Group and the Control group was -4.12%. As the upper 1-sided 95% confidence bound for the difference was 0.41%, this was less than the pre-specified non-inferiority margin of 6.89% ($P<0.0001$). In addition, the primary endpoint was met without propensity score adjustment (**Table 5**). It was noted that the Per Protocol and ITT populations were identical, so there were no differences in results based on population.

Table 5: TAXUS ATLAS Long Lesion Primary Endpoint

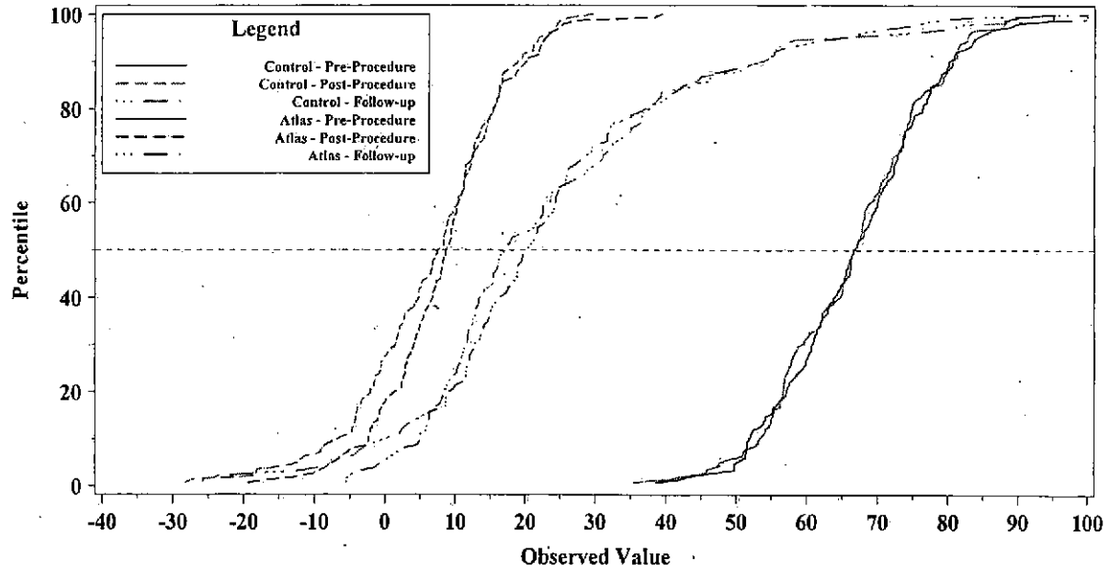
Intent-to-Treat Population	TAXUS Liberté Long (N=150)	TAXUS Express DES Control (N=145)	Difference [Upper 1-Sided 95% CL]	P-Value	Δ
Follow-up In-Segment Percent Diameter Stenosis					
Adjusted for the propensity score	31.43	35.55	-4.12 [0.41]	<0.0001	6.89
Unadjusted	31.65±17.24 (126) (8.34, 100.00)	32.57±19.28 (91) (2.54, 100.00)	-0.93 [3.19]	0.0010*	6.89

*Variances equal: Pooled t statistic

P values are for non-inferiority testing, with a margin of Δ.

The Per Protocol population was identical to the Intent-to-Treat population, therefore the Primary Endpoint analyses are the same.

Figure 2: TAXUS ATLAS Long Lesion Cumulative Frequency Distribution of In-Stent Percent Diameter Stenosis by QCA, Intent-to-Treat, All Patients (N=295)



	Post-Procedure		Follow-Up		Pre-Procedure	
	TAXUS Liberté Long (N=150)	TAXUS Express DES Control (N=145)	TAXUS Liberté Long (N=150)	TAXUS Express DES Control (N=145)	TAXUS Liberté Long (N=150)	TAXUS Express DES Control (N=145)
N	150	142	126	91	150	142
Mean	8.53	6.52	24.64	23.57	67.04	66.46
SD	9.33	10.69	19.69	23.04	11.01	10.88
Diff (95% CI)	2.00 [-0.29, 4.30]		1.07 [-4.64, 6.77]		0.58 [-1.94, 3.09]	

Post-Procedure and Follow-up measurements are in-stent measurements.

Clinical evaluations demonstrate that MACE, TVR, TLR and TVF were similar for patients in the TAXUS ATLAS Long Lesion Group and the DES Control Group. The 9-month Myocardial Infarction rate was numerically lower in TAXUS ATLAS Long Lesion Group (1.3%) as compared with the DES Control Group (6.3%) (**Table 6**). The rates for MACE and MACE components (cardiac death, MI, and TVR) demonstrate that safety profile of the TAXUS Liberté 38 mm stent is comparable to the commercially-available TAXUS Express stent for use in long lesions.

Table 6: TAXUS ATLAS Long Lesion Clinical Results

	9 months (ITT population)			1 year (per protocol population**)		
	TAXUS Liberte Long (N=150)	TAXUS Express Control (N=145)	P-Value	TAXUS Liberte Long (N=150)	TAXUS Express Control (N=145)	P-Value
EFFICACY						
TVR, Overall	8.7% (13/149)	8.5% (12/142)	0.9335	10.2% (15/147)	10.1% (14/139)	0.9705
TLR, Overall	6.0% (9/149)	7.0% (10/142)	0.7295	7.5% (11/147)	8.6% (12/139)	0.7207
TLR, PCI	5.4% (8/149)	6.3% (9/142)	0.7246	6.1% (9/147)	7.9% (11/139)	0.5527
TLR, CABG	0.7% (1/149)	0.7% (1/142)	1.0000*	1.4% (2/147)	0.7% (1/139)	1.0000*
Non-TLR, Overall	3.4% (5/149)	1.4% (2/142)	0.4484*	3.4% (5/147)	1.4% (2/139)	0.4486*
Non-TLR, PCI	2.0% (3/149)	1.4% (2/142)	1.0000*	2.0% (3/147)	1.4% (2/139)	1.0000*
Non-TLR, CABG	1.3% (2/149)	0.0% (0/142)	0.4986*	1.4% (2/147)	0.0% (0/139)	0.4986*
SAFETY						
Total Death	0.7% (1/148)	2.8% (4/142)	0.2061*	0.7% (1/147)	3.6% (5/139)	0.1120*
Cardiac Death or MI	1.3% (2/149)	8.5% (12/142)	0.0046	1.4% (2/147)	9.4% (13/139)	0.0024
Cardiac Death	0.0% (0/149)	2.8% (4/142)	0.0555*	0.0% (0/147)	3.6% (5/139)	0.0261*
MI	1.3% (2/149)	6.3% (9/142)	0.0255	1.4% (2/147)	6.5% (9/139)	0.0246
Q-wave MI	0.0% (0/149)	1.4% (2/142)	0.2373*	0.0% (0/147)	1.4% (2/139)	0.2353*
Non-Q-wave MI	1.3% (2/149)	4.9% (7/142)	0.0969*	1.4% (2/147)	5.0% (7/139)	0.0957*
Stent Thrombosis	0.0% (0/148)	0.7% (1/140)	0.4861*	0.0% (0/146)	0.7% (1/135)	0.4804*

* P-values are two-sided from Fisher's exact test; p-values without * are two-sided from the Chi-square test.
**After 9 months, the TAXUS ATLAS Long Lesion study population was reduced to a pre-specified cohort (per protocol population), which consists of all patients who received a study stent at baseline.

P values are not adjusted for multiple comparisons.
This trial was not adequately powered to compare the rate of low frequency events to a drug-eluting stent control group, nor was it sized to determine the rate of low frequency events with a pre-specified precision.

The secondary endpoints included several angiographic parameters, including in-stent percent diameter stenosis, binary restenosis, minimum lumen diameter (MLD), and late loss. QCA analysis demonstrated similar angiographic results in-stent, in-segment and at either edge for the TAXUS ATLAS Long Lesion Group and the Control group at the 9-month follow-up. A summary of the angiographic results are provided in **Table 7.**

Table 7: TAXUS ATLAS Long Lesion 9-Month Angiographic Results

Angiographic Outcomes[a]	TAXUS Liberté Long (N=150)	TAXUS Express Control (N=145)	P-Value
MLD (mm), In-stent			
Post-Procedure	2.60±0.40(150)	2.62±0.46(142)	0.7239
9-Month	2.13±0.65(126)	2.11±0.70(91)	0.8445
MLD (mm), Analysis Segment			
Post-Procedure	2.26±0.47(150)	2.23±0.52(142)	0.6469
9-Month	1.94±0.60(126)	1.88±0.65(91)	0.5160
% DS, In-stent			
Post-Procedure	8.53±9.33(150)	6.52±10.69(142)	0.0884
9-Month	24.64±19.69(126)	23.57±23.04(91)	0.7143
% DS, Analysis Segment			
Post-Procedure	21.29±8.90(150)	21.03±9.79(142)	0.8079
9-Month	31.65±17.24(126)	32.57±19.28(91)	0.7108
Late Loss, In-stent (mm)	0.49±0.55(126)	0.51±0.62(91)	0.8724
Late Loss, Analysis Segment (mm)	0.34±0.52(126)	0.36±0.58(91)	0.7756
Binary Restenosis			
In-stent restenosis	11.9% (15/126)	13.2% (12/91)	0.7777
Analysis segment restenosis	14.3% (18/126)	18.7% (17/91)	0.3850

[a] Includes all patients in the angiographic subset.
P-values are not adjusted for multiple comparisons.

Subgroup Analyses

There were no subgroup analyses performed in the TAXUS ATLAS Long Lesion clinical study.

XI. PANEL MEETING RECOMMENDATION AND FDA'S POST-PANEL ACTION

In accordance with the provisions of section 515(c)(2) of the Act as amended by the Safe Medical Devices Act of 1990, this PMA was not referred to the Circulatory Systems Devices Panel, an FDA advisory committee, for review and recommendation because the information in the PMA substantially duplicates information previously reviewed by this panel.

XII. CONCLUSIONS FROM CLINICAL AND NON-CLINICAL STUDIES

The data in this application support the reasonable assurance of safety and effectiveness of the TAXUS Liberté Long MR and OTW Coronary Stent Systems when used in accordance with the indications for use. Non-clinical studies, including biocompatibility, pharmacokinetics, engineering testing, coating characterization, chemistry, manufacturing and controls information, and stability testing demonstrate that the stent will perform as intended. Clinical study data demonstrate that the TAXUS Liberté Long MR and OTW Coronary Stent Systems are reasonably safe and effective for their intended use. The TAXUS Liberté Long stent was determined to be statistically non-inferior to the TAXUS Express stent with respect to in-segment percent diameter stenosis, the primary study endpoint. In addition, the rates for MACE and MACE components (cardiac death, MI, and TVR) demonstrate that the TAXUS Liberté Long stent was comparable to the TAXUS Express stent.

XIII. CDRH DECISION

CDRH issued an approval order on July 13, 2009. The final conditions of approval cited in the approval order are described below:

The applicant's manufacturing and sterilization facilities were inspected and were found to be in compliance with the Quality System Regulation (21 CFR 820 and pharmaceutical current Good Manufacturing Practice (cGMP) regulations.

XIV. APPROVAL SPECIFICATIONS

Directions for Use: See product labeling.

Hazard to Health from Use of the Product: See Indications, Contraindications, Warnings, Precautions and Adverse Events in the labeling.

Post Approval Requirements and Restrictions: See Approval Order.