

**MONITORING REPORT FORM (CDM-MR) \***  
**Version 01 - in effect as of: 28/09/2010**

**CONTENTS**

- A. General description of the project activity
  - A.1. Brief description of the project activity
  - A.2. Project participants
  - A.3. Location of the project activity
  - A.4. Technical description of the project
  - A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity
  - A.6. Registration date of the project activity
  - A.7. Crediting period of the project activity and related information
  - A.8. Name of responsible person(s)/entity(ies)
  
- B. Implementation of the project activity
  - B.1. Implementation status of the project activity
  - B.2. Revision of the monitoring plan
  - B.3. Request for deviation applied to this monitoring period
  - B.4. Notification or request of approval of changes
  
- C. Description of the monitoring system
  
- D. Data and parameters monitored
  - D.1. Data and parameters used to calculate baseline emissions
  - D.2. Data and parameters used to calculate project emissions
  - D.3. Data and parameters used to calculate leakage emissions
  - D.4. Other relevant data and parameters
  
- E. Emission reductions calculation
  - E.1. Baseline emissions calculation
  - E.2. Project emissions calculation
  - E.3. Leakage calculation
  - E.4. Emission reductions calculation
  - E.5. Comparison of actual emission reductions with estimates in the registered CDM-PDD
  - E.6. Remarks on difference from estimated value

\* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

**MONITORING REPORT**  
Version 03, Date 27/07/2012

**Zhangbei Manjing Windfarm Project**  
Reference number: 0233  
The 7<sup>th</sup> monitoring period (01/03/2011 - 29/02/2012)

**SECTION A. General description of the project activity**

**A.1. Brief description of the project activity: >>**

>>

The objective of the Zhangbei Manjing Windfarm Project is to generate renewable electricity using wind power resources and to sell the generated output to the North China Power Grid (NCPG) on the basis of a power purchase agreement (PPA). The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO<sub>2</sub> emissions from electricity generation by fossil fuel power plants that is supplied to NCPG. The project activity involves the installation and operation of 30 wind turbines with unit capacity of 1500kw. The total installed capacity is 45 MW.

Construction start date	28/07/2004
First turbine commission start date	30/12/2005
Full operation commission start date	18/08/2006
Date of CDM registration	23/03/2006
First renewable crediting period	01/01/2006 – 31/12/2012
Monitoring period	
(Volume 1)	01/01/2006 – 31/08/2006
(Volume 2)	01/09/2006 – 31/08/2007
(Volume 3)	01/09/2007 – 30/06/2008
(Volume 4)	01/07/2008 – 31/05/2009
(Volume 5)	01/06/2009 – 30/04/2010
(Volume 6)	01/05/2010 – 28/02/2011
(Volume 7)	
Start of this monitoring period	01/03/2011
End of this monitoring period	29/02/2012

The total emission reductions achieved in the current monitoring period are 69,012 tCO<sub>2</sub>e.

**A.2. Project Participants**

>>

Name of Party involved	Private and/or public entity(ies) project participants (as applicable)	Party involved wishes to be considered as project participant (Yes/No)
P.R. China (host)	Beijing Guotou Energy Conservation Company(BJGT)	No
United Kingdom of Great Britain and Northern Ireland	First Carbon Fund Ltd	No
Switzerland	Vitol S.A.	No

**A.3. Location of the project activity:**

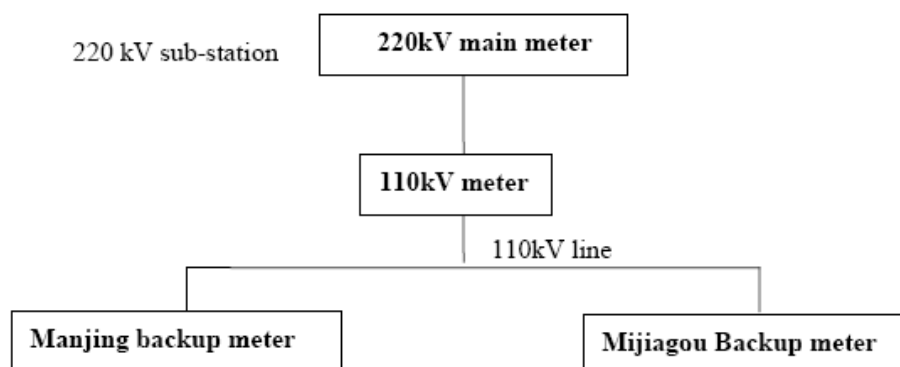
>>

Host country      People's Republic of China  
Province          Hebei  
City                Zhangjiakou  
County            Zhangbei  
GPS coordinates   114°32' E  
                         41°08' N

**A.4. Technical description of the project**

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The 1500kW wind turbines was GE 1.5sle. The electricity supplied to NCPG by the Zhangbei Manjing Windfarm currently shares the main electricity meter at 220kV level with Zhangbei Mijiagou wind farm as the following figure shows, so the meter at 220kV level measures the total electricity the two wind farms delivered to the NCPG.



**A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:**

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The approved methodology applied to this project is the approved baseline methodology: AM0005 (Version 1, Valid from 13/04/2004 to 01/03/2006) “baseline methodology (barrier analysis, baseline scenario development and baseline emission rate, using combined margin) for small grid- connected zero-emissions renewable electricity generation”. These documents are available from <http://cdm.unfccc.int/methodologies/DB/94GWIOIE6NL20BA94KY9ILMRUP48BN/view.html>

**A.6. Registration date of the project activity:**

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The registration date of the project is 23/03/2006.

**A.7. Crediting period of the project activity and related information (start date and choice of crediting period):**

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Crediting period	First renewable crediting period
Starting date of crediting period	01/01/2006
End date of crediting period	31/12/2012

**A.8. Name of responsible person(s)/entity(ies):**

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Contact information of the person(s)/entity(ies) responsible for completing the monitoring report form(CDM-MR):

The persons preparing the documentation were:

Mr. Shen Hongshuai, shenhongshuai@cecwpc.cn, Tel: +86 10 62248705;

Mr. Yao Xi, yaoxi@cecwpc.cn, Tel: +86 10 62248706;

Ms. Chen Dongjuan, chendongjuan@cecwpc.cn, Tel: +86 10 62248705.

## **SECTION B. Implementation of the project activity**

### **B.1. Implementation status of the project activity**

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The project activity was started construction on 28/07/2004. First turbine operation commission date started from 30/12/2005. The full operation commission date started from 18/08/2006.

During this monitoring period, the wind farm has a good running, smooth data transfer and grid connection, and no special events happened.

No events or situations occurred during the monitoring period, which may impact the applicability of the methodology.

### **B.2. Revision of the monitoring plan**

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The monitoring plan was revised, and has been approved by the CDM EB on 19/10/2007 and is listed on the project page.

The detailed description of the monitoring system is presented in the section “SECTION C. Description of the monitoring system”. <http://cdm.unfccc.int/Projects/DB/DNV-CUK1136989231.92/view>

### **B.3. Request for deviation applied to this monitoring period**

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N/A

### **B.4. Notification or request of approval of changes**

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The project activity is implemented as in the registered CDM-PDD; there is no notification or request of approval of changes from the project activity as described in the registered CDM-PDD.

## **SECTION C. Description of the monitoring system**

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### **1. Data collection procedures**

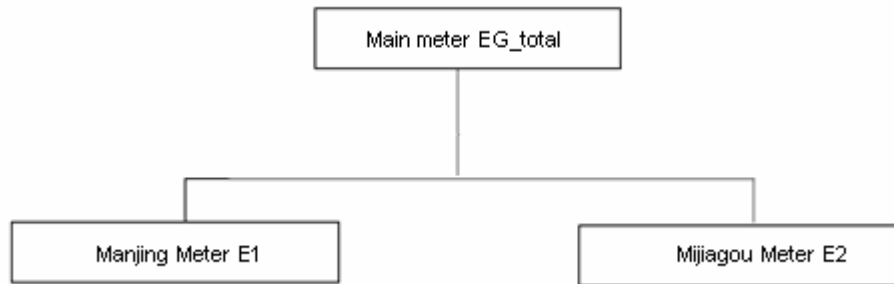
①Data generation and aggregation:

As described in the monitoring plan, the electricity supplied to NCPG by the project currently shares the main electricity meter at the 220kV substation level with the Zhangbei Mijiagou 49.5MW Windfarm project (CDM project number:0845), the net electricity supplied to the grid by the project (EG\_1) is achieved by the following monitored parameters:

Meters	Location	Description
EG_total	Inflow side of 220kV substation of power grid	Recording the electricity exported and imported to the power grid. Meter reading were read and recorded by the Power Grid Company and reported to project owner monthly. The data could be double checked by ETNs. Cut-off time of the ETNs is 24:00 of last day of the month.

E1	Outflow side of 110kV project site substation	Recording the electricity exported to the power grid by Zhangbei manjing project. Meter reading was read and record by onsite designated staff on a weekly/monthly basis.
E2	Outflow side of 110kV Mijiagou project site substation	Recording the electricity exported to the power grid by Zhangbei mijiagou project. Meter reading was read and record by onsite designated staff on a weekly/monthly basis.

The monitoring points shows below:



②Data calculation:

As described in the monitoring plan, the electricity delivered by Zhangbei Manjing Windfarm (EG\_1) can be calculated as:

$$EG_1 = EG_{total} * E1 / (E1 + E2)$$

Where:

EG\_1 is the calculated net electricity supply from the project activity;

EG\_total is the total net electricity supplied to the grid at the Zhangbei substation metered by the main meter;

E1 is the electricity generation metered from the Zhangbei Manjing Windfarm Project from the onsite meters;

E2 is the electricity generation metered from the Zhangbei Mijiagou 49.5MW Windfarm Project from the onsite meters.

**2. Organizational structure and responsibilities:**

Overall responsibility for monitoring and carrying out the monitoring following this monitoring plan lies with the Beijing Guotou Energy Conservation Company (BG).

Mr. Liu Bin, Head of the Management Office of the Zhangbei Manjing Windfarm, is responsible for the monitoring and reporting of the windfarm project.

Ms. Chen Dongjuan, CDM Project Manager, is responsible for the daily monitoring and reporting.

Beijing Guotou Energy Conservation Company (BG), in co-operation with Carbon Resource Management Ltd and the North China Power Grid Company will train the staff carrying out the monitoring work.

**3. Emergency procedures**

Should any previous months reading of the main meter be inaccurate by more than the allowable error, or otherwise functioned improperly, the net energy output shall be determined by:

(a) first, by reading the Zhangbei Manjing backup meter, unless a test by either party reveals it is inaccurate;

- (b) if the backup system is not with acceptable limits of accuracy or is otherwise performing improperly the Zhangbei Manjing Wind Farm and North China Power Grid shall jointly prepare an estimate of the correct reading;and
- (c) if North China Power Grid and Zhangbei Manjing Wind Farm fail to agree then the matter will be referred for arbitration according to agreed procedures.

#### SECTION D. Data and parameters

##### D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

<b>Data / Parameter:</b>	N/A
Data unit:	N/A
Description:	N/A
Source of data used:	N/A
Value(s) :	N/A
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	N/A
Additional comment:	N/A

##### D.2. Data and parameters monitored

<b>Data / Parameter:</b>	EF
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid
Measured /Calculated /Default:	Calculated
Source of data:	Calculated as the average of operating margin and build margin
Value(s) of monitored parameter:	0.7027
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	EF is given by $EF = w_{OM} * EF_{OMy} + w_{BM} * EF_{BM}$ with respective weight factors $w_{OM}$ and $w_{BM}$ (where $w_{OM} + w_{BM} = 1$ ), and by default, are weighted equally ( $w_{OM} = w_{BM} = 0.5$ ).
QA/QC procedures applied:	N/A

<b>Data / Parameter:</b>	EF_OM
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid (operating margin)
Measured /Calculated /Default:	Calculated
Source of data:	Calculated as TEM divided by TGEN, excluding the zero and low operating cost generating sources. Related data is from China Electric

	Power Yearbook (2011) and China Energy Statistical Yearbook (2011)
Value(s) of monitored parameter:	0.9485
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	$EF_{OMy} = TEMy / TGENy = [\sum_i F_{i,y} * COEF_i] / [\sum_j GEN_{j,y}]$ Details calculation refers to attached Excel sheet.
QA/QC procedures applied:	N/A

<b>Data / Parameter:</b>	EF_BM
Data unit:	tCO <sub>2</sub> e/MWh
Description:	CO <sub>2</sub> emissions factor of the grid (build margin)
Measured /Calculated /Default:	Calculated
Source of data:	Calculated as the build margin in the last few years, which is about 20% additions and the most conservative. First the build margin is calculated for the two years nearest 20% additions (above and below), then the most conservative (lowest) is chosen. Related data is from China Electric Power Yearbook (2008, 2009,2010,2011)
Value(s) of monitored parameter:	0.4570
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission calculation
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	N/A
Calculation method (if applicable):	$EF_{BMy} = \sum_i S_{i,y} * CEF_i$ Details calculation refers to attached Excel sheet.
QA/QC procedures applied:	N/A

<b>Data / Parameter:</b>	E1
Data unit:	MWh
Description:	The electricity generation metered from the Zhangbei Manjing Windfarm Project
Measured /Calculated /Default:	Measured
Source of data:	Meter reading record of onsite zhangbei manjing meter
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Serial No.	Accuracy	Calibration done on	Validity	Calibration frequency
	30089907	0.5S	14/10/2010	yes	Annually
			12/08/2011	yes	
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording weekly and monthly				
Calculation method (if applicable):	-				
QA/QC procedures applied:	<p>Electricity was measured continuously by the meter E1. Trained Staff from the Wind Farm recorded the meter readings manually on a weekly/ monthly basis (each Sunday at 0:00 and each 24:00 of the last day of the month). Reading records was saved as both hard and electrical copy.</p> <p>The meter readings were also transferred via a remote transmission line to the grid company. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to the grid company and project owner.</p>				

<b>Data / Parameter:</b>	E2				
Data unit:	MWh				
Description:	The electricity generation metered from the Zhangbei Mijiagou Windfarm Project				
Measured /Calculated /Default:	Measured				
Source of data:	Meter reading record of onsite zhangbei mijiagou meter				
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.				
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Serial No.	Accuracy	Calibration done on	Validity	Calibration frequency
	0007049D0145	0.5	14/10/2010	yes	Annually
			12/08/2011	yes	
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording weekly and monthly				
Calculation method (if applicable):	N/A				
QA/QC procedures applied:	<p>Electricity was measured continuously by the meter E2. Trained Staff from the Wind Farm recorded the meter readings manually on a weekly/ monthly basis (at 0:00 of each Sunday and 24:00 of the last day of each month). Reading records was saved as both hard and electrical copy. The meter readings were also transferred via a remote transmission line to the grid company. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to</p>				

	the grid company and project owner.
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<b>Data / Parameter:</b>	EG total				
Data unit:	MWh				
Description:	The total net electricity supplied to the grid of these two projects at the Zhangbei substation metered by the main meter				
Measured /Calculated /Default:	Measured				
Source of data:	Meter reading record of main meter at Zhangbei substation.				
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.				
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Serial No.	Accuracy	Calibration done on	Validity	Calibration frequency
	200407007 Z0062	0.2S	04/02/2011	yes	Annually
			07/01/2012	yes	
Measuring/ Reading/ Recording frequency:	Measuring continuously/Recording daily				
Calculation method (if applicable):	N/A				
QA/QC procedures applied:	Electricity was recorded continuously by grid company at 220kV substation. The data was daily recorded and monthly summarized. Monthly records from grid company was issued, stamped and sent to project owner. The meter was calibrated according to the national standard. The calibration is carried out annually by a qualified organization with the records being supplied to the grid company and project owner.				

<b>Data / Parameter:</b>	EG 1				
Data unit:	MWh				
Description:	The calculated power generation from the project activity				
Measured /Calculated /Default:	Calculated				
Source of data:	Meter readings from E1,E2 and EG total				
Value(s) of monitored parameter:	Detailed monthly data and calculation is presented in section E1 of the monitoring report.				
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline Emission calculation				
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A				
Measuring/ Reading/ Recording frequency:	N/A				
Calculation method (if applicable):	It was calculated from equation: $EG\_1 = EG\_total * E1 / (E1 + E2)$ More details are described in SECTION C				
QA/QC procedures applied:	The data are calculated by project owner before reported to DOE. Internal auditing reduced the risk of error caused by data transfer and				

calculation mistakes.

## SECTION E. Emission reductions calculation

### E.1. Baseline emissions calculation

>>

The latest EF for this monitoring period is calculated as the following equations:

$$EF = wOM * EF\_OMy + wBM * EF\_BMy$$

$$EF\_OMy = TEMy / TGENy = [\sum_i Fi,y * COEFi] / [\sum_j GENj,y]$$

$$EF\_BMy = \sum_i Si,y * CEFi$$

$$EF = 0.5 * 0.9485 + 0.5 * 0.4570 = 0.7027 \text{ tCO}_2\text{e/MWh}$$

Please refer to the Emission Reductions Calculation sheet for detail.

$$EG\_y = EG\_1 = EG\_total * E1 / (E1 + E2)$$

The detailed calculation of EG\_y is calculated below:

Months	E1 (MWh)	E2 (MWh)	EG_Total (MWh)	EG_1 (MWh)	ETN (MWh)	EG_y (MWh)
	A	B	C	D=C*A/(A+B)	E	F=Min(D,E)
01/03/2011-31/03/2011	14,250.720	11,281.600	25,333.704	14,139.864	14,139.864	14,139.864
01/04/2011-30/04/2011	10,780.000	9,075.440	19,454.292	10,562.207	10,562.207	10,562.207
01/05/2011-31/05/2011	12,955.360	10,945.440	23,746.668	12,871.813	12,871.813	12,871.813
01/06/2011-30/06/2011	6,393.200	5,778.960	11,965.800	6,284.813	6,284.813	6,284.813
01/07/2011-31/07/2011	5,199.040	4,962.320	10,027.908	5,130.760	5,130.760	5,130.760
01/08/2011-31/08/2011	4,569.840	4,584.800	9,011.244	4,498.259	4,498.259	4,498.259
01/09/2011-30/09/2011	4,531.120	4,526.720	8,920.164	4,462.249	4,462.249	4,462.249
01/10/2011-31/10/2011	7,049.680	7,050.560	13,844.688	6,921.912	6,921.912	6,921.912
01/11/2011-30/11/2011	7,250.320	6,540.160	13,434.300	7,063.059	7,063.059	7,063.059
01/12/2011-31/12/2011	8,892.400	7,077.840	15,708.792	8,746.823	8,746.823	8,746.823
01/01/2012-31/01/2012	6,609.680	5,731.440	12,067.968	6,463.385	6,463.385	6,463.385
01/02/2012-29/02/2012	11,123.200	9,696.720	20,710.536	11,064.761	11,064.761	11,064.761
<b>Total</b>	/	/	/	98,209.904	98,209.905	98,209.904

The baseline emissions in year y are calculated as:

$$BE\_y = EG\_1 * EF$$

Monitoring Period	EG_1 (MWh)	EF (tCO <sub>2</sub> e/MWh)	BE_y (tCO <sub>2</sub> e)
01/03/2011-29/02/2012	98,209.904	0.7027	69,012

### E.2. Project emissions calculation

>>

According to the applied methodology, as a renewable energy project, the project emissions of this project are not required to be considered.

**E.3. Leakage calculation**

>>

According to the applied methodology, as a renewable energy project, the Leakages of this project are not required to be considered.

**E.4. Emission reductions calculation / table**

>>

According to the applied methodology, the emission reductions in year y (ER<sub>y</sub>) should be calculated as:

$$ER_y = BE_y$$

Total baseline emissions: 69,012 tCO<sub>2</sub>e

Total emission reductions: 69,012 tCO<sub>2</sub>e

**E.5. Comparison of actual emission reductions with estimates in the CDM-PDD**

>>

This section shall include a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered CDM-PDD.

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO <sub>2</sub> e)	97,848 tCO <sub>2</sub> e	69,012 tCO <sub>2</sub> e

**E.6. Remarks on difference from estimated value in the PDD**

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The actual emission reductions during this monitoring period are 69,012 tCO<sub>2</sub>e, which is less than the estimated value in the registered PDD. There is no any significant increase compared with the estimated emission reduction in the registered PDD.

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**History of the Monitoring Report**

Version	Date	Nature of revision
03	27/07/2012	Updated according to DOE's findings.
02	19/06/2012	Updated according to DOE's findings.
01	20/04/2012	Initial adoption.

### History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Guideline, Form <b>Business Function:</b> Issuance		