The Spec files, etc. adopted in the seasonal adjustment of the Indices of Industrial Production using the X-12-ARIMA method

(1) Method

Not only seasonal but also 'trading-day and holiday' and 'leap-year' effects are adjusted as follows:

Seasonal adjustment index = Original Index / (Seasonal, 'Trading-day and holiday' and 'Leap-year' indices)

(Indices of Producers' Inventories and Inventory Ratio were adjusted by only seasonal effects.)

(2) Spec File

The spec files of X-12-ARIMA for seasonal adjustment are as follows:

```
series { start = 2005.1
         span = (2005.1,2011.12)
         decimals = 1 }
transform { function = log }
arima { model = (2 1 0)(0 1 1) }
regression { variables = (td1nolpyear lpyear)    *1
             save = (td hol)
             user = (jap-hol)
             usertype = holiday
             start = 2005.1
             file = "xxxxxxxxxxxxxxxxxxx" }
forecast { maxlead = 12 }
estimate { save = ( mdl )
           maxiter = 500 }
x11 { print = (none + d10 + d11 + d16)
      save = (d10 d11 d16)
      seasonalma = x11default }
```

*1: In the case of indices of Producers' inventories and Inventory Ratio, delete the brackets after the word "regression"

(3) Employment of seasonal index, 'trading-day and holiday' and 'leap-year' indices

The method of temporary seasonal adjustment is adopted for the seasonal index after January 2012. Concretely to say, the monthly seasonal index in 2011 is adopted as those in 2012. As for 'trading-day and holiday' and 'leap-year', indices, this method is not adopted, and 'trading-day and holiday' and 'leap-year' indices are calculated from estimated parameters in (2) and calendar.

(4) Outlier detection

In the 2011 Annual Revision, outlier–detected indices, type of outliers and period of outliers are as follows:

Type of index		Type of Outliers	Period of Outliers
Production index	Production	TC	March, 2011
	Shipments	TC	March, 2011
	Inventories	TC	March, 2011
		AO	May, 2011
	Inventory ratio	TC	April, 2011
Operating ratio index, Production capacity index	Operating ratio	TC	March, 2011
		AO	April, 2011
Production forecast index	actual production in the previous month	TC	March, 2011
	production forecasted for the current month	TC	April, 2011
	production plan for the following month	AO	May, 2011

TC: temporary change
AO: additive outlier

That is, the spec file modified for the 2011 Annual Revision is as follows:
＜In the case of Production index＞

regression { variables = (td1nolpyear lpyear **tc2011.3**)