



# Global Derivatives Committee

## CME Complex Options Extensions

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## Document History

Revision	Date	Author	Revision Comments
0.1	2008-04-07	Matt Simpson, CME	initial draft
0.2	2008-06-25	Matt Simpson, CME	Added StrikePriceBoundaryPrecision field to specify threshold percentage for an option to take effect
0.3	2008-07-18	Matt Simpson, CME	Clarified StrikePriceDeterminationMethod enumeration 3 to indicate that strike is determined based on the average of the underlying <u>settlement prices</u> . Incorporated other feedback from the working group Added several simple examples
0.4	2008-11-18	Matt Simpson, CME	Incorporated feedback from GTC onsite session in NYC - Added support for PayOutAmount to ComplexEvent component which allows multiple payouts to occur for a given instrument. PayOutAmount will remain in the Instrument block in support of simple binary options - Changed the all references of ExoticEvent to ComplexEvent
0.5	2008-12-23	Matt Simpson, CME	Incorporated feedback from GTC meeting Added usage notes to definition of ComplexEventCondition Added examples of ComplexEventDate and ComplexEventTime Corrected several typographical errors
	January 2, 2009	L. Taikitsadaporn	Added EP#
	February 4, 2009	L. Taikitsadaporn	Clarified conditional requirements around repeating group field comments to be consistent.

## 1 Introduction

Provide support for complex options which is both flexible and extensible

## 2 Business Workflow

Extend the current instrument modeling capabilities to support a wide variety of exotics options. Complex options are used to extend trading and risk management capabilities in both the central market place and the OTC arena. CME currently offers digital options on Fed Funds futures and Hurricane Futures. Both contracts are cash settled.

Complex options are similar to standard options in many respects. They allow new variations of the basic In-the-money / Out-of-the-money paradigm to be modeled. They are used in both Exchange and OTC settings. They generally are “options on cash” although may also be “options on futures” or even “option on physical”. Complex options can be used as a substitute for complex option spreads. They can be used to mimic other risk mitigation mechanisms such as Insurance Loss Warranties (ILW’s) which mitigate loss in the event of natural disasters. They typically have rapid payouts following a triggered event. Perhaps most importantly, they are more closely attuned to an investors view of the market.

CME would like to support the following types of complex options; digital, digital range, digital all-or-none, single barrier, double barrier, digital barrier, capped (floored), capped barrier, average price (Asian), Bermuda, average strike, and look-back. *The definitions for these options can be found in the glossary.* In addition to these fairly simple exotics CME would also like to support complex complex option in which an unlimited number of complex events may be specified for a single option instrument.

The model proposed herein provides an extensible framework which can support complex combinations of complex behaviors. It also provides a sound basis for future extensions and elaboration as new types of complex behaviors are introduced.

The model was developed with eye toward the precedent set by FpML and has incorporated FpML-like concepts where appropriate.

## 3 Issues and Discussion Points

### 3.1 Complex Instrument Definition

#### 3.1.1 Instrument Block Extensions for Exotics

A number of fields will be added to the Instrument block which summarize the behavior of a complex option. These field determine the pay out type of an option, specify the methods for determining the strike price and underlying price, as well as define the boundary methods for strike price and underlying price.

#### 3.1.2 ComplexEvent Group

The ComplexEvent Group is a repeating block which allows an unlimited number and types of events in the lifetime of an option to be specified.

#### 3.1.3 ComplexEventDate and ComplexEventTime Groups

The ComplexEventDate and ComplexEventTime groups are used to constrain a complex Event to a specific date range or time range. If specified the event is only effective on or within the specified dates and times. The ComplexEventTime Group is nested within the ComplexEventDate in order to further qualify any dates placed on the event and is used to specify time ranges for which a complex event is effective. It is always provided within the context of start and end dates. The time range is assumed to be in effect for the entirety of the date or date range specified

## 4 Proposed Message Flow

### 5 FIX message tables

### 6 FIX component blocks

#### 6.1 Instrument Component Block

Tag	FieldName	Req'd	Comments	Action	Mapping Usage and Comments
55	Symbol	N	Common, "human understood" representation of the security. SecurityID value can be specified if no symbol exists (e.g. non-exchange traded Collective Investment Vehicles) Use "[N/A]" for products which do not have a symbol.		
65	SymbolSfx	N	Used in Fixed Income with a value of "WI" to indicate "When Issued" for a security to be reissued under an old CUSIP or ISIN or with a value of "CD" to indicate a EUCP with lump-sum interest rather than discount price.		
48	SecurityID	N	Takes precedence in identifying security to counterparty over SecurityAltID block. Requires SecurityIDSource if specified.		
22	SecurityIDSource	N	Required if SecurityID is specified.		
<i>Start of Component block, expanded in line &lt; SecAltIDGrp &gt;</i>					
454	NoSecurityAltID	N			
→	455	SecurityAltID	N		
→	456	SecurityAltIDSource	N		
<i>End of Component block, expanded in line &lt; SecAltIDGrp &gt;</i>					
460	Product	N	Indicates the type of product the security is associated with (high-level category)		
1227	ProductComplex	N	Identifies an entire suite of products for a given market. In Futures this may be "interest rates", "agricultural", "equity indexes", etc		
1151	SecurityGroup	N	An exchange specific name assigned to a group of related securities which may be concurrently affected by market events and actions.		
461	CFICode	N	Indicates the type of security using ISO 10962 standard, Classification of Financial Instruments (CFI code) values. It is recommended that CFICode be used instead of SecurityType for non-Fixed Income instruments.		
167	SecurityType	N	It is recommended that CFICode be used instead of SecurityType for non-Fixed Income instruments. Required for Fixed Income. Refer to Volume 7 - Fixed Income Futures and Options should be specified using the CFICode[461] field instead of SecurityType[167] (Refer		

<i>Tag</i>	<i>FieldName</i>	<i>Req'd</i>	<i>Comments</i>	<i>Action</i>	<i>Mapping Usage and Comments</i>
			to Volume 7 - Recommendations and Guidelines for Futures and Options Markets.)		
762	SecuritySubType	N	Sub-type qualification/identification of the SecurityType (e.g. for SecurityType="MLEG"). If specified, SecurityType is required.		
200	MaturityMonthYear	N	Specifies the month and year of maturity. Applicable for standardized derivatives which are typically only referenced by month and year (e.g. S&P futures). Note MaturityDate (a full date) can also be specified.		
541	MaturityDate	N	Specifies date of maturity (a full date). Note that standardized derivatives which are typically only referenced by month and year (e.g. S&P futures), may use MaturityMonthYear and/or this field. When using MaturityMonthYear, it is recommended that markets and sell sides report the MaturityDate on all outbound messages as a means of data enrichment.		
1079	MaturityTime	N			
966	SettleOnOpenFlag	N	Indicator to determine if Instrument is Settle on Open.		
1049	InstrmtAssignmentMethod	N			
965	SecurityStatus	N	Gives the current state of the instrument		
224	CouponPaymentDate	N	Date interest is to be paid. Used in identifying Corporate Bond issues.		
225	IssueDate	N	Date instrument was issued. For Fixed Income IOIs for new issues, specifies the issue date.		
239	RepoCollateralSecurityType	N	(Deprecated in FIX.4.4)		
226	RepurchaseTerm	N	(Deprecated in FIX.4.4)		
227	RepurchaseRate	N	(Deprecated in FIX.4.4)		
228	Factor	N	For Fixed Income: Amortization Factor for deriving Current face from Original face for ABS or MBS securities, note the fraction may be greater than, equal to or less than 1. In TIPS securities this is the Inflation index. Qty * Factor * Price = Gross Trade Amount For Derivatives: Contract Value Factor by which price must be adjusted to determine the true nominal value of one futures/options contract. (Qty * Price) * Factor = Nominal Value		
255	CreditRating	N			
543	InstrRegistry	N	The location at which records of ownership are maintained for this instrument, and at which ownership changes must be recorded. Can be used in conjunction with ISIN to address ISIN uniqueness issues.		
470	CountryOfIssue	N	ISO Country code of instrument issue (e.g. the country portion typically used in ISIN). Can be used in conjunction with non-ISIN SecurityID (e.g. CUSIP for Municipal Bonds without ISIN) to provide uniqueness.		
471	StateOrProvinceOfIssue	N	A two-character state or province abbreviation.		
472	LocaleOfIssue	N	The three-character IATA code for a locale (e.g. airport code for Municipal Bonds).		
240	RedemptionDate	N	(Deprecated in FIX.4.4)		

<i>Tag</i>	<i>FieldName</i>	<i>Req'd</i>	<i>Comments</i>	<i>Action</i>	<i>Mapping Usage and Comments</i>
202	StrikePrice	N	Used for derivatives, such as options and covered warrants		
947	StrikeCurrency	N	Used for derivatives		
967	StrikeMultiplier	N	Used for derivatives. Multiplier applied to the strike price for the purpose of calculating the settlement value.		
968	StrikeValue	N	Used for derivatives. The number of shares/units for the financial instrument involved in the option trade.		
1478	StrikePriceDeterminationMethod	N	Specifies how the strike price is determined at the point of option exercise. The strike may be fixed throughout the life of the option, set at expiration to the value of the underlying, set to the average value of the underlying, or set to the optimal value of the underlying. Conditionally, required if value is other than "fixed"	Add field	See data dictionary
1479	StrikePriceBoundaryMethod	N	Specifies the boundary condition to be used for the strike price relative to the underlying price at the point of option exercise.	Add field	See data dictionary
1480	StrikePriceBoundaryPrecision	N	Used in combination with StrikePriceBoundaryMethod to specify the percentage of the strike price in relation to the underlying price. The percentage is generally 100 or greater for puts and 100 or less for calls.	Add field	See data dictionary
1481	UnderlyingPriceDeterminationMethod	N	Specifies how the underlying price is determined at the point of option exercise. The underlying price may be set to the current settlement price, set to a special reference, set to the optimal value of the underlying during the defined period ("Look-back") or set to the average value of the underlying during the defined period ("Asian")	Add field	See data dictionary
206	OptAttribute	N	Used for derivatives, such as options and covered warrants to indicate a versioning of the contract when required due to corporate actions to the underlying. Should not be used to indicate type of option - use the CFICode[461] for this purpose.		
231	ContractMultiplier	N	For Fixed Income, Convertible Bonds, Derivatives, etc. Note: If used, quantities should be expressed in the "nominal" (e.g. contracts vs. shares) amount.		
969	MinPriceIncrement	N	Minimum price increment for the instrument. Could also be used to represent tick value.		
1146	MinPriceIncrementAmount	N	Minimum price increment amount associated with the MinPriceIncrement [969]. For listed derivatives, the value can be calculated by multiplying MinPriceIncrement by ContractValueFactor [231]		
996	UnitOfMeasure	N	0		
1147	UnitOfMeasureQty	N			
1191	PriceUnitOfMeasure	N			
1192	PriceUnitOfMeasureQty	N			
1193	SettlMethod	N	Settlement method for a contract. Can be used as an alternative to CFI Code value		
1194	ExerciseStyle	N	Type of exercise of a derivatives security		
1482	OptPayoutType	N	Indicates the type of payout that will result from an in-the-money option. Valid values are vanilla, capped and digital (binary).	Add new field	See data dictionary



Tag	FieldName	Req'd	Comments	Action	Mapping Usage and Comments
1195	OptPayoutAmount	N	Cash amount indicating the pay out associated with an option. For binary options this is a fixed amount. Conditionally required if OptPayoutType/Tag TBD is set to binary.	Modify field name	
1196	PriceQuoteMethod	N	Method for price quotation		
1197	FuturesValuationMethod	N	For futures, indicates type of valuation method applied		
1198	ListMethod	N	Indicates whether the instruments are pre-listed only or can also be defined via user request		
1199	CapPrice	N	Used to express the ceiling price of a capped call		
1200	FloorPrice	N	Used to express the floor price of a capped put		
201	PutOrCall	N	Used to express option right		
1244	FlexibleIndicator	N	Used to indicate if a security has been defined as flexible according to "non-standard" means. Analog to CFICode Standard/Non-standard indicator		
1242	FlexProductEligibilityIndicator	N	Used to indicate if a product or group of product supports the creation of flexible securities		
997	TimeUnit	N	Used to indicate a time unit for the contract (e.g., days, weeks, months, etc.)		
223	CouponRate	N	For Fixed Income.		
207	SecurityExchange	N	Can be used to identify the security.		
970	PositionLimit	N	Position Limit for the instrument.		
971	NTPositionLimit	N	Near-term Position Limit for the instrument.		
106	Issuer	N			
348	EncodedIssuerLen	N	Must be set if EncodedIssuer field is specified and must immediately precede it.		
349	EncodedIssuer	N	Encoded (non-ASCII characters) representation of the Issuer field in the encoded format specified via the MessageEncoding field.		
107	SecurityDesc	N			
350	EncodedSecurityDescLen	N	Must be set if EncodedSecurityDesc field is specified and must immediately precede it.		
351	EncodedSecurityDesc	N	Encoded (non-ASCII characters) representation of the SecurityDesc field in the encoded format specified via the MessageEncoding field.		
component block <SecurityXML>		N	Embedded XML document describing security.		
691	Pool	N	Identifies MBS / ABS pool		
667	ContractSettlMonth	N	Must be present for MBS/TBA		
875	CPProgram	N	The program under which a commercial paper is issued		
876	CPreRegType	N	The registration type of a commercial paper issuance		
<i>Start of Component block, expanded in line &lt; EvntGrp &gt;</i>					
864	NoEvents	N			
→	865	EventType			
→	866	EventDate			
→	1145	EventTime	Specific time of event. To be used in combination with EventDate [866]		
→	867	EventPx			
→	868	EventText			
<i>End of Component block, expanded in line &lt; EvntGrp &gt;</i>					
873	DatedDate	N	If different from IssueDate		

Tag	FieldName	Req'd	Comments	Action	Mapping Usage and Comments
874	InterestAccrualDate	N	If different from IssueDate and DatedDate		
	component block <InstrumentParties>	N	Used to identify the parties listing a specific instrument		
	component block <ComplexEvent>	N	Used to describe complex behaviors associated with an option	Add new component	

## 6.2 ComplexEvent Component Block

Add a new component called the ComplexEvent Group used to describe the events which define a complex option

Tag	Field Name	Req'd	Action	Mappings and Usage Comments	Comments	
1483	NoComplexEvents	N	Add field		Number of complex event occurrences	
→	1484	ComplexEventType	N	Add field	if NoExoticOptions > 0	Identifies the type of complex event. Required if NoComplexEvents > 0
→	1485	ComplexOptPayoutAmount	N	Add Field		Cash amount indicating the pay out associated with an event. For binary options this is a fixed amount.
→	1486	ComplexEventPrice	N	Add field		Specifies the price at which the complex event takes effect. Impact of the event price is determined by the ComplexEventType/ tag TBD.
→	1487	ComplexEventPriceBoundaryMethod	N	Add field		Specifies the boundary condition to be used for the event price relative to the underlying price at the point the complex event outcome takes effect as determined by the ComplexEventPriceTimeType.
→	1488	ComplexEventPriceBoundaryPrecision	N	Add field		Used in combination with StrikePriceBoundaryMethod to specify the percentage of the strike price in relation to the underlying price. The percentage is generally 100 or greater for puts and 100 or less for calls.
→	1489	ComplexEventPriceTimeType	N	Add field		Specifies when the complex event outcome takes effect. The outcome of a complex event is a payout or barrier action as specified by the ComplexEventType

→	1490	ComplexEventCondition	N	Add field		Specifies the condition between complex events when more than one event is specified. Multiple barrier events would use an “or” condition since only one can be effective at a given time. A set of digital range events would use an “and” condition since both conditions must be in effect for a payout to result.
→	component block <ComplexEventDate>		N	Add block		Used to specify the dates and time ranges when a complex event is in effect.
>						

### 6.3 ComplexEventDate Component Block

Add a new ComplexEventDate component to specify the dates for which a given event may occur

Tag	Field Name	Req'd	Action	Mappings and Usage Comments	Comments	
1491	NoComplexEventDates	N	Add field		Number of complex event date occurrences for a given complex event	
→	1492	ComplexEventStartDate	N	Add field		Specifies the start date on which a complex event is effective. The start date will be set equal to the end date for single day events such as Bermuda options Required if NoComplexEventDates > 0.
→	1493	ComplexEventEndDate	N	Add field		Specifies the end date on which a complex event is effective. The start date will be set equal to the end date for single day events such as Bermuda options Required if NoComplexEventDates > 0.
→	component block <ComplexEventTime>		N	Add block		Used to specify time ranges for which a complex event is effective. Always provided within the context of start and end dates. The time range is assumed to be in effect for the entirety of the date or date range specified

### 6.4 ComplexEventTime Component Block

Add a new ComplexEventTime component to specify the times for which a given event may occur

Tag	Field Name	Req'd	Action	Mappings and Usage Comments	Comments
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1494	<b>NoComplexEventTimes</b>	N	Add field		Number of complex event time occurrences for a given complex event date
→	1495 <b>ComplexEventStartTime</b>	N	Add field		Specifies the start time on which a complex event date is effective. Required if NoComplexEventTimes > 0.
→	1496 <b>ComplexEventEndTime</b>	N	Add field		Specifies the end time to which a complex event date is effective. Required if NoComplexEventTimes > 0.

## 7 Appendix A - Data Dictionary

Tag	Field Name	Action	Data type	Description	FIXML Abbreviation	Add to / Deprecate from Message type or Component block
1478	StrikePriceDeterminationMethod	Add field	Int	<p>Specifies how the strike price is determined at the point of option exercise. The strike may be fixed throughout the life of the option, set at expiration to the value of the underlying, set to the average value of the underlying, or set to the optimal value of the underlying. Conditionally, required if value is other than "fixed"</p> <p>Valid values are:                      1 - Fixed strike                      2 - Strike set at expiration to underlying or other value (lookback floating)                      3 - Strike set to average of underlying settlement price across the life of the option                      4 - Strike set to optimal value                      100 and above - reserved for bilaterally agreed to values</p>	StrkPxDtrmnMeth	Add to Instrument block
1479	StrikePriceBoundaryMethod	Add Field	Int	<p>Specifies the boundary condition to be used for the strike price relative to the underlying price at the point of option exercise.</p> <p>Valid values are:                      1 - less than underlying price is ITM                      2 - less than or equal to underlying price is ITM                      3 - equal to underlying price is ITM                      4 - greater than or equal to underlying price is ITM                      5 - greater than underlying is ITM</p>	StrkPxBndryMeth	Add to Instrument Block

Tag	Field Name	Action	Data type	Description	FIXML Abbreviation	Add to / Deprecate from Message type or Component block
1480	StrikePriceBoundaryPrecision	Add field	Percent	Used in combination with StrikePriceBoundaryMethod to specify the percentage of the strike price in relation to the underlying price. The percentage is generally 100 or greater for puts and 100 or less for calls.	StrkPxBndryPrctn	Add to Instrument Block
1481	UndlyPriceDeterminationMethod	Add field	Int	Specifies how the underlying price is determined at the point of option exercise. The underlying price may be set to the current settlement price, set to a special reference, set to the optimal value of the underlying during the defined period ("Look-back") or set to the average value of the underlying during the defined period ("Asian option")  Valid values are: 1 - Regular 2 - special reference 3 - optimal value (Lookback) 4 - average value (Asian option)	UndlyPxDtrmnMeth	Add to Instrument Block
1482	OptPayoutType	Add field	Int	Indicates the type of payout that will result from an in-the-money option. Valid values are vanilla, capped and digital (binary).  Valid values are: 1 - Vanilla 2- Capped 3 - Binary	OptPayoutTyp	Add to Instrument Block
1483	NoComplexEvents	Add field	NumInGrp	Number of complex event occurrences		Add to ComplexEvent Block

Tag	Field Name	Action	Data type	Description	FIXML Abbreviation	Add to / Deprecate from Message type or Component block
1484	ComplexEventType	Add field	Int	Identifies the type of complex event. Valid values are: 1 - capped 2 - trigger 3 - Knock-in up 4 - Knock-in down 5 - Knock-out up 6 - Knock-out down 7 - Underlying 8 - Reset Barrier 9 - Rolling Barrier	CmplxEvtTyp	Add to ComplexEvent Block
1485	ComplexOptPayoutAmount	Add field	Amt	Cash amount indicating the pay out associated with an event. For binary options this is a fixed amount.	CmplxOptPayAmt	Add to Complex Event Block
1486	ComplexEventPrice	Add field	Price	Specifies the price at which the complex event takes effect. Impact of the event price is determined by the ComplexEventType(1484).	CmplxEvtPx	Add to ComplexEvent Block
1487	ComplexEventPriceBoundaryMethod	Add field	Int	Specifies the boundary condition to be used for the event price relative to the underlying price at the point the complex event outcome takes effect as determined by the ComplexEventPriceTimeType.  Valid values are: 1 - Less than EventPx 2 - Less than or equal to EventPx 3 - Equal to EventPx 4 - Greater than or equal to EventPx 5 - Greater than EventPx	CmplxEvtPxBndryMeth	Add to ComplexEvent Block
1488	ComplexEventPriceBoundaryPrecision	Add field	Percent	Used in combination with ComplexEventPriceBoundaryMethod to specify the percentage of the strike price in relation to the underlying price. The percentage is generally 100 or greater for puts and 100 or less for calls.	CmplxEvtPxBndryPrctn	Add to ComplexEvent Block

Tag	Field Name	Action	Data type	Description	FIXML Abbreviation	Add to / Deprecate from Message type or Component block
1489	ComplexEventPriceTimeType	Add field	Int	<p>Specifies when the complex event outcome takes effect. The outcome of a complex event is a payout or barrier action as specified by the ComplexEventType</p> <p>Valid values are:                      1 - Expiration                      2 - Immediate (At Any Time)                      3 - Specified Date/Time</p>	CmplxEvtPxTmTyp	Add to ComplexEvent Block
1490	ComplexEventCondition	Add field	Int	<p>Specifies the condition between complex events when more than one event is specified. ComplexEventCondition is conditionally required when there are more than one ComplexEvent occurrences. A chain of ComplexEvents must be linked together through use of the ComplexEventCondition in which the relationship between any two events is described. For any two ComplexEvents the first occurrence will specify the ComplexEventCondition which links it with the second event</p> <p>Multiple barrier events would use an "or" condition since only one can be effective at a given time. A set of digital range events would use an "and" condition since both conditions must be in effect for a payout to result.</p> <p>Valid values:                      1 - And                      2 - Or</p>	CmplxEvtCond	Add to ComplexEvent Block
1491	NoComplexEventDates	Add field	NumInGroups	Number of complex event date occurrences for a given complex event.		Add to ComplexEventDate Block



Tag	Field Name	Action	Data type	Description	FIXML Abbreviation	Add to / Deprecate from Message type or Component block
1492	ComplexEventStartDate	Add field	UTCTime stamp	Specifies the start date of the date range on which a complex event is effective. The start date will be set equal to the end date for single day events such as Bermuda options. ComplexEventStartDate must always be less than or equal to ComplexEventEndDate.	StartDt	Add to ComplexEventDate Block
1493	ComplexEventEndDate	Add field	UTCTime stamp	Specifies the end date of the date range on which a complex event is effective. The start date will be set equal to the end date for single day events such as Bermuda options. ComplexEventEndDate must always be greater than or equal to ComplexEventStartDate.	EndDt	Add to ComplexEventDate Block
1494	NoComplexEventTimes	Add field	NumInGroup	Number of complex event time occurrences for a given complex event date. The default in case of an absence of time fields is 00:00:00-23:59:59.		Add to ComplexEventTime Block
1495	ComplexEventStartTime	Add field	UTCTime Only	Specifies the start time of the time range on which a complex event date is effective. ComplexEventStartTime must always be less than or equal to ComplexEventEndTime.	StartTm	Add to ComplexEventTime Block
1496	ComplexEventEndTime	Add field	UTCTime Only	Specifies the end time of the time range on which a complex event date is effective. ComplexEventEndTime must always be greater than or equal to ComplexEventStartTime.	EndTm	Add to ComplexEventTime Block

## 8 Appendix B - Glossary Entries

Term	Definition	Field where used
Average Price (Asian) Option	The underlying price is an average of the daily settlement prices over a specified period	
Average Strike	The strike price is an average of the daily settlement prices over a specified period	
Barrier	The option becomes active (knock-in) or inactive (knock-out) based on a predetermined price level	
Capped Asian	A capped option which pays out based on the average price of the underlying	
Capped Barrier	A capped option which becomes active or inactive based on the crossing of a barrier	
Capped Call	The option has a linear payout (like a vanilla) up to a capped amount as specified by a cap price	
Capped Payout	The payout amount is capped based on the difference between the strike and a cap price for call options and a floor price for put options	
Binary	The option pays out a fixed amount based on whether a trigger price is reached	
Binary All or None	Fixed pay out if the underlying settles on a predefined trigger price	
Binary Barrier	A digital option which becomes active or inactive based on the crossing of a barrier. Events are linked through "And" condition	
Binary One Touch	Immediate fixed pay out if the underlying reaches the predefined trigger price at any point during the life of the instrument	
Binary Range	Fixed pay out if the underlying settles between an upper and lower trigger price	
Double Barrier	An option that has a combination of activation/inactivation conditions. Specifies multiple price levels at which the option becomes active (knock-in) or inactive (knock-out)	
Down and In	the option becomes active if the underlying price drops below the specified barrier	
Down and Out	The option becomes inactive if the underlying price drops below the specified barrier	
Fixed Payout	The payout amount is specified at inception. Associated with Binary options (Yes, it pays or No, it doesn't pay)	
Floored Put	The option has a linear payout (like a vanilla) up to a capped amount as specified by a floor price	
Look-back	The underlying price is set to the optimal value of the daily settlement prices over a specified period.	
One Touch	One Touch further defines the terms, usually specific dates and times, for when the option will pay out in the context of a trigger price.	
Reset Barrier	After hitting the barrier the next specified barrier goes into effect. The payoff depends on the maximum or minimum of the underlying price over the look-back period. The option becomes active (knock-in) or inactive (knock-out) based on a	

Term	Definition	Field where used
	predetermined price level	
Rolling/Ratchet Barrier	The option is issued with a sequence of barriers either all below (roll-down calls) or all above (roll-up puts) the current underlying price. Upon reaching each barrier the options strike is lowered for calls or raised for puts. The option is knocked-out at the last barrier	
Up and In	The option becomes active if the underlying price exceeds the specified barrier	
Up and Out	the option becomes inactive if the underlying price exceeds the specified barrier	
Vanilla Payout	The payout amount is determined by the difference between the strike and the underlying	

## 9 Appendix C - Usage Examples

### 9.1 Complex Event Date and Complex Event Time Examples

(in FIXML)

#### 1. Event is effective on expiration date only

```
<CmplxEvtDtGrp>
```

```
  <CmplxEvtDt StartDt="2008-12-31" EndDt="2008-12-31" />
```

```
</CmplxEvtDtGrp>
```

#### 2. Event is effective during the Q1 2009

```
<CmplxEvtDtGrp>
```

```
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2009-03-31" />
```

```
</CmplxEvtDtGrp>
```

#### 3. Event is effective in three separate periods throughout Q1 2009. Dates on which economic events are announced are excluded (2009-01-19, 2009-02-16, 2009-03-17)

```
<CmplxEvtDtGrp>
```

```
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2008-01-18" />
```

```
  <CmplxEvtDt StartDt="2009-01-20" EndDt="2009-02-15" />
```

```
  <CmplxEvtDt StartDt="2009-02-17" EndDt="2009-03-16" />
```

```
  <CmplxEvtDt StartDt="2009-03-18" EndDt="2009-03-31" />
```

```
</CmplxEvtDtGrp>
```

#### 4. Event is effective from 1500-1600 hours during the life of the contract

```

<CmplxEvtDtGrp>
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2009-03-31" >
    <CmplxEvtTm StartTm="15:00" EndTm="16:00"/>
  </CmplxEvtDt>
</CmplxEvtDtGrp>

```

5. Event is effective on a 24 hour basis other than the hours of 1500-1600 when it is ineffective. On the last day it is effective only until 1500.

```

<CmplxEvtDtGrp>
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2009-03-30" >
    <CmplxEvtTm StartTm="00:00:01" EndTm="15:00:00"/>
    <CmplxEvtTm StartTm="16:00:00" EndTm="23:59:59"/>
  </CmplxEvtDt>
  <CmplxEvtDt StartDt="2009-03-31" EndDt="2009-03-31" >
    <CmplxEvtTm StartTm="00:00:01" EndTm="15:00:00"/></CmplxEvtDt>
</CmplxEvtDtGrp>

```

6. Event is effective from 0700-1800 with the exception of 1500-1600 hours when it is ineffective during the life of the contract

```

<CmplxEvtDtGrp>
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2009-03-31" >
    <CmplxEvtTm StartTm="07:00:00" EndTm="14:59:59"/>
    <CmplxEvtTm StartTm="16:00:01" EndTm="18:00:00"/>
  </CmplxEvtDt>
</CmplxEvtDtGrp>

```

7. Event is effective on a 24 hour basis starting on Day1 at 0700. On the final day the event is effective only until 1500.

```

<CmplxEvtDtGrp>
  <CmplxEvtDt StartDt="2009-01-02" EndDt="2009-01-02" >
    <CmplxEvtTm StartTm="07:00:00" EndTm="23:59:59"/>
  </CmplxEvtDt>
  <CmplxEvtDt StartDt="2009-01-03" EndDt="2009-03-30" />
  <CmplxEvtDt StartDt="2009-03-31" EndDt="2009-03-31" >
    <CmplxEvtTm StartTm="0:00:01" EndTm="15:00:00"/>
  </CmplxEvtDt>
</CmplxEvtDtGrp>

```

## 9.2 Complex Option Examples

(in FIXML)

Note that actual definitions have been substituted for enumeration values

### 1. Binary Option

```
<Instrmt  
  SecTyp= OOP  
  SubTyp= Binary  
  PutCall = Call  
  Strk= 100.0  
  ExerStyle= American  
  UndPxDetMeth= Regular  
  PayOutTyp= Binary  
  PayOutAmt= 10,000 >
```

### 2. Euro FX Double Barrier

```
<Instrmt  
  ID= EC  
  MMY= 200809  
  SecTyp= OOF  
  SubTyp= Barrier  
  PutCall = Call  
  Strk=13350.0  
  ExerStyle= European  
  UndPxDetMeth= Regular  
  PayOutTyp= Vanilla >  
<EventPx EventPxTyp= Knock-out down  
  EventPx= 13300.0  
  EventPxBndryMeth= less than or equal to  
  EventPxTimeTyp= Immediate />  
</Instrmt>  
<EventPx EventPxTyp= Knock-in up  
  EventPx= 13370.0  
  EventPxBndryMeth= greater than or equal to  
  EventPxTimeTyp= Immediate />  
</Instrmt>
```

### 3. Euro FX Capped Call – One Touch

<Instrmt

ID=EC

MMY= 200809

SecTyp= OOP

SubTyp= Cap

PutCall = Call

Strk= 13350.0

ExerStyle= European

UndPxDetMeth= Regular

PayOutTyp= Capped >

<EventPx EventPxTyp= Capped

EventPx= 13400.0

EventPxBndryMeth= greater than or equal to

EventPxTimeTyp= **Immediate** />

</Instrmt>