

# CTP main system training Course series - crude oil business

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- 1. Introduction of the development of CTP
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# 1. Introduction of the development of CTP

- A brief introduction of the CTP development and market share in recent years.

## Scope of business of Shanghai Futures Information Technology Co., Ltd.

- 1. Regulatory Agency

CSRC, Margin Monitoring Center, SHFE, CFFE, INE

- 2. Futures Company

Room and cabinets rental, CTP software rental, CTPMini, other CTP products, Test and certificate services

- 3. Investors

Simnow product services, Trading API support services

# The development process of CTP system

The renewal and replacement of the technical system is pushed by the rapid development of the market, increasing influence and increasing number of investors

- 2007 : first CTP transaction was made
- 2009 : The first **CTP branch system** (次用系统) is online ; The first independently deployed **main system** (主用系统) was online
- 2012 : CTP API becomes a factual industry standard
- Today : Seeking what is finite from what is infinite,

## 2. Support for crude oil business by CTP

- Brief description of CTP's account registration, crude oil trading, settlement, risk control and foreign exchange business.

# Brief introduction of CTP system

- Settlement system (Support settlement businesses, opening accounts, fund management, and other business for all exchanges)
- Trading system (The transaction system is mainly responsible for order processing and quotation forwarding, and completes the connecting between investors and exchanges. )
- Risk control system (Efficient real-time risk monitoring and risk trial calculation)
- Futures-Bank system (connecting with banks to achieve bank transfer and foreign exchange transactions )

# Trade instructions and comparison (p23)

- SHFE & INE :
  - (1) limit order & FAK & FOK
  - (2) Null market order
  - (3) Option self hedging & execution declaration & bilateral quotation & inquiry
- CFFE :
  - (1) limit order & FAK & FOK
  - (2) Market price: any price, any price to limit price, 5 market price, 5 market price to limit price, best price & best price to limit price
  - (3) Application combination instruction & combination disassembly instruction
  - (4) Bilateral quotation & inquiry & execution declaration
- DCE :
  - (1) limit order & FAK & FOK
  - (2) Market order
  - (3) Stop loss order & stop profit order & inter temporal arbitrage & cross variety arbitrage & Swap & Extension
  - (4) Bilateral quotation & inquiry & execution declaration
- ZCE:
  - (1) Limit order & IOC & FOK
  - (2) Intertemporal arbitrage & cross variety arbitrage
  - (3) Bilateral quotation & inquiry & execution declaration & give up the right to execute



# Closing position rule (p24)

## SHEF & INE

No combination with distinction among close position of today, close position of yesterday; first open first close

Forced closing: first for speculation, then hedging. First, Selling option, then futures positions, then long option positions. By the total open interest after market close, first choose contract with a large position as a forced contract. Then it is determined by the sequence of client net loss of the member

## CFFE

first open first close, no distinction among close position of today, close position of yesterday; first combination then individual.

Forced closing: as for the forced closing of combined contract, it is determined by priority and will not split.

## DEC

first open first close, no distinction among close position of today, close position of yesterday, first individual then combination.

Forced closing: first for speculation, then hedging. Then, according to the contract position at the end of the last trading day, the position of each client will be closed. Then futures contracts are equal to option contracts, a closed position is chosen according to the principle of first futures and then options. If the holding positions are the, it would be according to the futures contract code from small to large (in sequence according to the alphabetical order of the variety code, the order of the contract month), When the contract code is the same, first for large positions, for closing positions; as for options with the same positions, first for sell, small code, low strike price, call

## ZCE

first open first close, first individual then combination., first speculative then hedging

# Special instructions provided by CTP (p25)

- Server pre buried orders & server pre buried orders withdrawal

Principle: in the appropriate period, the report or withdrawal instructions are stored in advance to the transaction backstage server, the background server receives the appropriate transaction state switching signal, the instruction is triggered instantaneously, and the transaction is reported to the system.

Entry time: only at "non transaction" and "aggregate bidding matching", it can be sent to the server.

Trigger time: only allowed in non trading times by the server, triggered by the "start trading" signal of the next trading festival, and converted into an ordinary order after the trigger.

Terms of use: by API interface for all investors.

Revocation: withdrawal can be made before it is triggered. After the closing, the order is automatically cleared.

- Server conditional order

Principle: setting the trigger price condition, storing the order instructions on the server, receiving the market signal in the background, judging whether the conditions are satisfied, and if the conditions are satisfied, the instructions are triggered instantaneously and reported into the trading system.

Reporting time: before closing, orders can be reported in

Trigger time: triggered by the set market conditions, triggering only in continuous trading hours.

Terms of use: investors need to apply for permission to Futures Company, Futures Company can control.

Revocation: it can be deleted directly before it is triggered, and automatically cancelled after closing.

# The calculation of the service fee in the CTP (p26)

- SHFE&INE

There is close today order, fee is generally charged by the amount, and is set to "0" through close today order. The algorithm is consistent when the transaction is not settled.

- CFFE

There is no close today order, fee is generally charged by the amount, and is set to "0" through close today order. The algorithm is consistent when the transaction is not settled.

- DEC

There is no close today order, fee is generally charged by lots, and is set to "0" through close today order. Or by amount, fee is generally a half through close today order. Fully charged for short-term transactions, give back after settlement. For special product, fee for close today order is assigned to open position.

- ZCE

There is no close today order, fee is generally charged by lots, and is set to "0" through close today order.

- Freezing fee

Fee for general price limits (including FAK and FOK ) are frozen according to the price of the declaration.

Fee for the market price order and the stop loss (profit) are frozen according to the price limit.

Fee for the combination order (including arbitrage, extension an so on) is frozen according to yesterday's settlement price.

# Trading risk management- real-time calculation of margin in CTP (p27)

- SHFE&INE

Futures: general holding margin =  $\sum \text{position} * \text{contract price (the latest price / last settlement price / closing price / opening price, configurable, last settlement price yesterday position)}$  \* contract multiplier \* margin rate

Unilateral large margin discount, investors do not depend on the margin direction of the exchange.

- CFFE

Cross variates one-way large margin, investors do not rely on the exchange margin direction.

Support speculating and security deposit setting up separately

- DEC

Futures arbitrage is with margin discount, when investors and exchanges are in the same direction.

If the latest price is chosen, the margin will be calculated according to the latest price.

- Deposit freeze for sent orders

General limit orders (including FAK and FOK instructions) are frozen according to the price of the declaration.

The market price orders and stop loss (profit) orders are frozen according to the price limit.

The combination orders (including arbitrage, extension and exchange) are frozen according to the settlement price yesterday.

# Trading risk management- real-time calculation of margin in CTP (p28)

- SHFE & INE one-way big side (investors and exchanges may not be in the same direction)

Suppose the price of the all contract for the same species is 100 yuan. Assuming that the margin rate of the exchange is 25%, investors are facing two situations:

1, the average monthly margin rate is 5 points additional for the exchange, then that is 30%.

2, near the delivery month, the contract will be adjusted to 10 points additional, or 35%, from the company's needs.

The initial state is as follows:

The investor holds 12 positions in long positions, all of which are held near the month of delivery.  $25 \times 12 = 300$ , investor margin is:  $35 \times 12 = 420$ ,

Holding 7 short hand positions, all of them are ordinary monthly positions, and the exchange margin is:  $25 \times 7 = 175$ , investor margin is  $30 \times 7 = 210$

So by one way big side logic, the investor's margin is 420 yuan.

# Trading risk management- real-time calculation of margin in CTP (p29)

- SHFE & INE one way big side (investors and exchanges may not be in the same direction)

	Cu1510 long	Cu1510 short
Detail of bilateral holding deposit	50	60
frozen detail of Bilateral opening	30	10
Bilateral total margin details	80	70
Large side margin deposit	60	
Large side margin freezing	$80-60=20$	

- One way big side margin discount (P30)
  - A) according to the transaction code;
  - B) the same customer will hold a two-way store in the same member, overseas special broker participant and overseas intermediary agency.
  - C) two-way holdings of non Futures Company members and overseas special non broker participants.
  
- One way big side margin discount cancellation
  - A) closes after the fifth trading day before the final trading day.

CTP implementation: Flex- [transaction management] - transaction parameter settings [special transaction rule product settings] special product type: choose one way large side products.

# New funding items in the CTP real-time algorithm (p31)

- The amount of money pledged in: the amount of currency in which the foreign currency is deposited into the quoted currency (under the existing rules, CTP refers to the pledge of the US dollar to RMB).
- The amount of currency pledged out: the amount of currency quoted into foreign currency (under the existing rules, the RMB account in CTP is 0).
- Currency pledged balance
- delay exchange freezing amount :Exchange not finished in day T but would be done at T+1 is with freezing
- Remaining exchange quota : Exchange not finished in day T, CNY and USD freezing amount in T+1 is controlled
- If the quota  $>0$
- CNY drawable in T+1= $\max(\text{CNY drawable} - \text{remaining exchange quota in T}, 0)$
- USD drawable in T+1= $\max(\text{USD drawable} + \text{remaining exchange quota in T} / \text{exchange rate by the exchange/pledge discount}, 0)$



# Crude oil futures trading rules (p32)

- Monetary pledge:

Pledge the funds of an investor's one currency account in another account temporarily.

The currency pledge business is only used in the brokerage house, and it does not need to go through the exchanges and banks.

pledge includes one kind of money borrowed (pledge into) and the other currency .

There are only RMB trading accounts in the market, and the foreign exchange has been uniformly pledged at the time of settlement, according to the intermediate price announced by the China foreign exchange trading center on the same day. It is considered to be used in RMB by the discount rate.

- The period of use of money pledged funds:

Trading hours: currency pledge can be used for margin or margin, commission and profit or loss according to different configurations.

settlement period: currency pledge funds can only be used as margin.

# Crude oil futures trading rules (p33)

Money pledge ratio (6.3.11 version cancelled this setting)

Monetary pledge discount rate & Exchange Rate Management

The calculation of currency pledge funds (6.3.9 version fully supports automation, without manual intervention).

Ordinary varieties can only be traded with RMB.

The amount of the application for pledge should not be greater than the amount of the pledging amount in the source currency account. The amount of the source currency = the available capital of the source currency \* the pledged ratio

The amount of money in the currency pledge is recalculated according to the exchange rate and the discount rate of the pledge. The amount of the target currency = the amount of the source currency \* the exchange rate \* the discount rate.

Revoking pledging calculation(the 6.3.9 version is fully self supporting without manual intervention.)

Trading hours: Revoking pledging amount must be lower than the pledging amount for this currency. Revoking pledging amount must be less than available balance

Settlement hours: only revoking pledging amount must be lower than the pledging amount for this currency. Revoking pledging amount not need be less than available balance. If it causes negative balance, add margin.

# Crude oil futures trading rules (p34)

- The use of RMB as an quoted currency

Method	Quote Currency	Domestic Currency	Foreign Currency	Pledge rules	
1	CNY	CNY	USD	The US dollar is pledged into CNY, and special variety margin is given priority to the use of pledged currency funds.	Only for special variety margin occupation
2 ✓	CNY	CNY	USD		For a margin, a profit and loss, fee

- CTP implementation: Flex- [transaction management] - transaction parameter settings [special transaction rule product settings]

Special product type: choose currency pledge products; trading currency: choose RMB;

The scope of pledge funds: choose fees, profit and loss, margin.

# The transaction fund algorithm (p35)

- Equity = last equity + profit and loss of closing positions (overlooking the profit and loss algorithm) + unrealized profit and loss (ignoring the floating profit and loss algorithm) - fee + fund in - fund out - credit quota - last pledge + pledge - last money pledged in + last monetary pledged out - monetary pledged out + premium balance
- RMB funds available = real-time equity - the current margin - freezing margin - freezing fee + freezing fund (negative) - holding profit and loss (ignoring float under break algorithm) profit and loss for the ordinary products positions (based on available float under the profit and loss calculation) + profit and loss for special product position ( calculate according to the available float under the profit and loss algorithm ) - profit and loss for unwinded positions (ignoring profit and loss of unwinded positions algorithm) + positions available balance of profit and loss - currency pledge - frozen premium - delay balance of currency exchange to freeze.
- funds pledge: Max (initial pledge funds + in real-time pledge - real-time pledge - specific position and margin to take up and freeze + profit and loss for specific products (or floating profit and loss algorithm) + min (profit and loss for special products close position - fee for special products or freeze, 0), 0)
- available funds for Open positions = RMB available funds + currency pledge balance
- Available closing position profit and loss: for special types, if the profit and loss above commission, it shall be included in the RMB account .otherwise, it shall be included in the pledge account.
- Delay exchange freeze funds: if T day exchange quota > 0, the funds needed to freeze at T + 1 =, the rest of the exchange quota at T (the values is real-time updated) \* (2 \* 2 - exchange pledge discount) / (2 - exchange pledge discount)

- The calculation of fund drawable (p36)

Calculated middle value of fund drawable (not reflected) = equity-current deposit – freezing deposit- freezing fees- net profit of holding positions (ignore floating net profit) +net profit of holding positions of normal product (calculated by available floating net profit) +net profit of holding positions of special underlings (calculated by available floating net profit)-net profit of closing position (ignore profit of closing position) +net profit drawable from closing positions - balance of currency pledge-freezing equity - pledge+ min (pledge, deposit) -remaining CNY currency exchange quota.

- New basic deposit= max{min (fund pledged (1+adjustment factor) -deposit, adjustment factor \* fund pledged) , New basic deposit Setting}

- A = Calculated middle value of fund drawable \* drawable proportion

- B = ( Calculated middle value of fund drawable + previous CNY drawing at that day) \* drawable proportion – previous CNY drawing at that day

- C = Calculated middle value of fund drawable – new basic fund

- CNY drawable=min 【 min(A, B, C)+freezing fund (negative number) , equity- the lowest equity requirement】

- USD drawable= 【pledging balance+ min (CNY usable, 0) -max(0, net profit of closing positions of special underlings)】 /exchange rate/discount rate-remaining USD currency exchange quota

# Examples of fund drawable (p38)

- April 9<sup>th</sup> is a trading day, a customer can use fund of 100 yuan with pledged fund of 20, the ratio can be drawing is 0.7. so the fund drawable:  **$(100-20) \times 0.7=56$**
- with a money out of 10 yuan, what is the fund drawable?  $(100-20)*0.7-10=46$
- with another money out of 20 yuan, what is the fund drawable?  $(100-20)*0.7-10-20=26$
- With an add of 10 yuan, what is the fund drawable?  $(100+10-20)*0.7-10-20=33$

# Examples of fund drawable (p39)

Last equity	Profit & loss from closing position	Profit & loss from holding position	fees	Last pledge	The amount of pledge	Margin	Minimum fund setting (by settlement platform)
100000	4000	500	100	80000	80000	90000	10

- 1 what's current equity ? fund available?
2. New minimum fund setting ? Fund drawable ?

- Result: (p40)

1. current equity =104400, fund available =14400

2. New minimum fund setting =10000 and Fund drawable =4400

- If the margin is 100000

1. current equity =104400, available funds =4400

2. New minimum fund setting =10 and Fund drawable =4390

- If the margin is 60000

1. current equity =104400, available funds =44400

2. New minimum fund setting =20000 and Fund drawable =4400



The CTP transaction interface related to crude oil (<http://www.sfit.com.cn> can get the latest API.)  
(p41)

Modification: OnRspQryTradingAccount : request to query funds account response

//// delayed exchange rate freezing amount

TThostFtdcMoneyType FrozenSwap;

//// remaining quota of exchange

TThostFtdcMoneyType RemainSwap;

Add: ReqQrySecAgentTradingAccount : request to inquire level-2 agent fund account.

Add: OnRspQrySecAgentTradingAccount : query level-2 agent fund account response

Add: ReqQrySecAgentCheckMode : request to inquire level-2 agent fund verification mode.

Add: OnRspQrySecAgentCheckMode : query level-2 agent fund verification mode response

Optimization: optimize the Windows version API of connection limit, and repair the blocking problem when the user exits and releases API in the Fens access mode.

# CTP transaction interface - option related

(<http://www.sfit.com.cn> can get the latest API)  
(p42)

- Add self-hedging related interface for SHFE options

Add: ReqOptionSelfCloseInsert : option hedging entry request

Add: ReqOptionSelfCloseAction: option self hedging operation request

Add: ReqQryOptionSelfClose: request to query of option self-hedging

Add: OnRspOptionSelfCloseInsert: request response of option from self -hedging entry

Add: OnRspOptionSelfCloseAction: request response of option from self -hedging operation

Add: OnRspQryOptionSelfClose: request to query option from self-hedging response

Add: OnErrRtnOptionSelfCloseInsert: false response of option self-hedging entry

Add: OnErrRtnOptionSelfCloseAction: false response of option self-hedging operation

Add: OnRtnOptionSelfClose: option self-hedging notice

# CTP transaction management terminal (p43)

- Trader transaction terminal

The main functions of the trader's trading terminal include submit / withdrawal (ordinary orders, local pre burying, server pre burying and condition orderds), funds, entrustment, transaction and holding information, locking the program, modifying the user password, checking the password of the investor and synchronizing the cipher of the investor.

- Bank-futures management terminal

The main functions include transfer query and manual correction, synchronization of key, user funds query, company fund query, investor inquiry, contact inquiry and signing bank inquiry.

- Monitoring terminal

The main functions of the monitoring terminal include user session management, login prohibition, information inquiry and emergency function.

# TU trader terminal crude oil related functions -- comprehensive enquiry of overseas intermediaries (p44)

境外中介机构综合账户查询

境外中介机构账户  币种

境外中介机构综合账户

投资者帐号	上次质押金额	昨权益	入金	出金	冻结保证金	冻结权利金	冻结手续费	保证金	权利金	手续费	平仓盈亏	持仓盈亏	权益	可用
12345	0.00	16,143,034.82	0.00	220.00	0.00	0.00	0.00	372,137.00	0.00	174,825.00	0.00	-17,550.00	15,950,671.45	15,950,671.45
12345	0.00	0.00	36.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9999	0.00	9,990,000.00	0.00	0.00	2,892,244.00	0.00	2,110,573.50	9,277,499.70	0.00	5,770,945.95	10,000.00	69,664.00	5,288,718.05	-9,000,000.00
9999	0.00	100,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100,000.00	100,000.00

投资者代码  境外中介机构账户

境外中介机构资金校验

投资者代码	币种	境外中介机构资金帐号	是否资金共用
00023002	CNY	12345	是
00023002	USD	12345	是
00023006	CNY	12345	是
00023006	USD	12345	是
00023008	CNY	12345	是
00023008	USD	12345	是
001234	CNY	9999	是
001234	USD	9999	是
.....	.....	.....	.....

# TU trader terminal crude oil related functions -- residual exchange quota and delayed foreign exchange freezing amount inquiry (p45)

查询数据 -- Option

委托 成交 持仓 持仓明细 组合持仓明细 资金 产品保证金 服务器预埋 服务器预埋撤单 本地预埋 执行宣告 T型报价 询价 询价价差参数 报价

资金账号

币种

穿仓  强平  追保  警示  正常  异常

风险排序

查询

投资者帐号	风险度	风险状态	昨权益	延时换汇冻结金额	剩余换汇额度	可取资金	入金	出金	冻结保证金
12017601	0.00	警示	900,000,000.00	0.00	0.00	809,978,930.10	0.00	0.00	5,049.00

# Change of CTP risk control interface - crude oil correlation (p46)

- Add: ReqQrySyncDelaySwap: delayed foreign exchange query interface
- Add: OnRspQrySyncDelaySwap: delayed foreign exchange query response interface
- Add: ReqQrySecAgentTradingAccount: request to inquire level-2 agent fund account.
- Add: OnRspQrySecAgentTradingAccount: query level-2 agent fund account response
- Add: ReqQrySecAgentCheckMode: request to inquire level-2 agent fund verification mode.
- Add: OnRspQrySecAgentCheckMode: query level-2 agent fund verification mode response
- Add: OnRtnSecAgentCheckMode: overseas intermediaries funds verification mode synchronous interface
- Amendment: OnRtnRiskSyncAccount: investor's fund return interface (if you need to inquire the foreign agency general account funds, AccountID needs to be filled in the SecAgentID of the overseas intermediary agency)
- Amendment: OnRtnSeqPreRiskAccount: ordered yesterday fund return interface (if you need to inquire the foreign agency general account funds, AccountID needs to be filled in the SecAgentID of the overseas intermediary agency)

# RCwin terminal crude oil related functions (p47)

- Add: screening conditions for overseas intermediaries:[order submit inquiry], [transaction inquiry], [location inquiry]
- Add:[delayed foreign exchange query].
- Optimization: [overseas intermediary comprehensive account] query function
- Add: forced closing position of individual customer for level-2 agents.
- Add: support level-2 agent pressure test function.

# Transaction related parameter setting (p48)

- Add the exchange: [transaction management] - [transaction parameter settings] - [exchange settings]

- Add a seat:

[transaction management] - [brokerage firm management] - [trader setting]

[transaction management] - [brokerage firm management] - brokerage company and membership code comparison table]

[transaction management] - [multi-trading center management] - [the maintenance of correspondence between seats and trading centers]

- Add product: [transaction management]- [transaction parameter settings] - [Product settings]

- Add product: [transaction management] - [transaction parameter settings] - [contract settings]

- Add quoted currency: [transaction management] - [transaction parameter settings] - [product settings of special transaction rule ]

- Add discount rate:

[money management] - [currency pledge management]- [investor currency pledge discount rate management]

[money management] - [currency pledge management]- [exchange currency pledge discount rate management]

- Exchange rate management: [daily settlement]- [exchange rate management]